THE IRON AGE

New York, May 27, 1920

ESTABLISHED 1855 VOL. 105: No. 22

Steel Ingots of Small Cross Section

Casting in Groups from Electric Furnaces for Direct Rolling Into Horseshoes—Marked Savings by the New Process

BY JOHN G. WEBB

CASTING ingots of small cross section has long been considered as commercially impracticable. After two years of experimenting a process has been developed at the plant of the Old Dominion Iron & Steel Corporation, Belle Isle, Richmond, Va., whereby ingots 2 in. x 28 in. long are successfully poured on a commercial scale. Heretofore rolled steel products of small cross section have generally been worked down from ingots of much greater cross section. Many rolled products, such as horseshoe blanks, would absolutely answer the purpose if they could be rolled directly from an ingot of approximately the finished cross section.

One of the principal products of the Old Dominion Iron & Steel Corporation is horseshoes. There are about 100 different standard sizes and shapes, ranging in weight from 10 oz. to 50 oz., the average weight being about 1½ lb. Formerly ingots from 5 in. sq. up to 7 in. sq. were broken down or rolled into small billets 2 in. sq. by 30 in. long which, after reheating, were passed through the horseshoe train and rolled into blanks, sheared to correct lengths, reheated and then bent, formed and punched.

With the new process ingots of approximately the finished cross section are cast in molds of a special design, patented by J. G. Webb, the author, which after reheating are put directly through the horseshoe train and the succeeding operation. The metal used is produced in two Webb electric furnaces, and is of 0.10 to 0.20 per cent carbon. The high temperature and consequent fluidity of the metal makes it possible to pour ingots of 2 in. sq. cross section.

The molds are poured from a bottom pour ladle. By novel means they can be handled in clusters and poured 30 at each opening of the ladle nozzle. After the metal is set, the molds are picked up 15 at a time, the ingots shaken out and the molds placed for the next heat. Water is sprayed on the ingots to cool them and they are then conveyed to the reheating furnaces and roll train. It takes less than 10 min. to pour three tons of small ingots, at a cost of $3 per ton more than the cost of pouring into ingots 5 in. or

Fig. 1

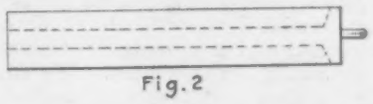


Fig. 2

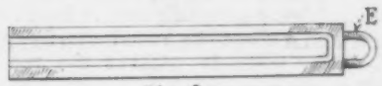


Fig. 3

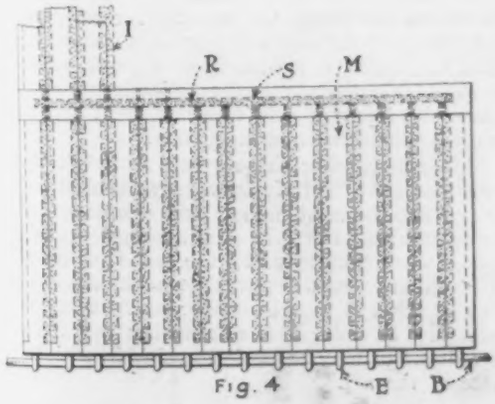


Fig. 4

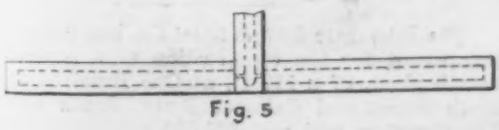


Fig. 5

Figs. 1, 2 and 3 Represent the Mold Members of a Group. The pouring position is shown by Figs. 4 and 5 and the condition, when shaking out the ingots, by Fig. 6. The metal is poured in through the hot top *S* and flows through the runner *R* to ingots *I* included between mold members *M*. The molds are picked up by the rod *B*, Fig. 6, passing through eyes *E* and placed upon the support *L*. The clamp *P* is removed and the ingots fall out. *P* is replaced and the ingot molds are again set up as in Figs. 4 and 5.

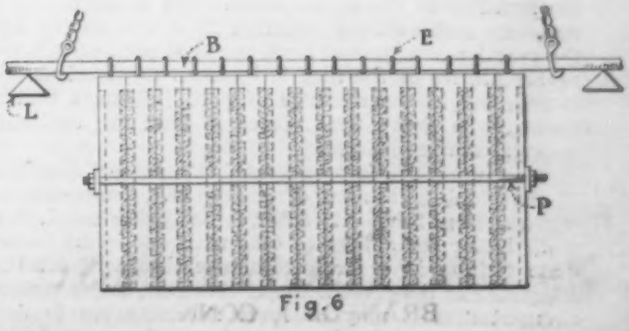


Fig. 6

7 in. square. The sink head and runners recovered from the ingots weigh about 5 per cent of the cast and are salvaged and remelted.

In breaking down large ingots there is a heating furnace loss of about 2 per cent on which there is no salvage and a 5 per cent loss due to crops, etc., which is salvaged and remelted. The losses at the horseshoe train are about equal whether small ingots or broken down billets are used. The present cost of breaking down large ingots, shearing, etc., is about $17 per ton. A very conservative estimate of saving would be $10 per ton in favor of small ingots.

PURCHASING MATERIALS

Standing and Ability of the Vendors the Governing Factors

Although devoted to the purchase of gears, points equally applicable to the purchase of other materials were set forth in a paper on "Gears from a Purchaser's Standpoint" presented by G. D. Stanbrough, general superintendent Packard Motor Car Co., Detroit, at the recent convention of the American Gear Manufacturers' Association, Detroit. "When you undertake the purchase of any article from rough stock to finished parts," Mr. Stanbrough said, "the first question that comes to mind is the standing and ability of the vendors of the special commodities which you are purchasing. Your chances of selecting a satisfactory source of supply is governed by the following general conditions:

1—The personnel of the organization.
2—Their financial support.
3—Their general business reputation.
4—The location of the plant to sources of supply and transportation centers.
5—General business ability.
6—The labor market.
7—The general character of the plant buildings.
8—The character of their equipment.

"We cannot underestimate the value of weighing all these considerations. I will discuss them, in the order named, briefly.

Plant Personnel and Reputation

1.—It is a well known fact that no firm nor the product that they make is any greater than the men that make up that business. An organization to machine and manufacture successfully should be made up of men who are good mechanics, whose reputations have stood the test of time for doing good work. Men who know the proper methods to be used and have courage enough to use them. The organization from a personnel standpoint should be well balanced—should include a good business man, good mechanical talent and a good engineer.

2.—We cannot underestimate the value of ample financial resources. Such resources will relieve the men who are in charge of operations from worries and allow them to put their efforts on the production. Adequate finances permit the purchase of stock in different quantities to insure a steady flow of product, and this is particularly necessary in the manufacture of gears where many operations and much time is consumed. The firm that is handicapped for money to meet stock bills and to pay the payroll cannot be counted upon to produce with the same steadiness as can be expected under more propitious circumstances.

3.—The only thing that we can tell about a firm or an individual, with any degree of certainty, is his record of past performances. Business ability is reflected in the stability of the organization. The prosperity of a company embraces its standing in a community and the reaction as apparent from personal contact with the representative of the firm in business transactions. It is reflected in the measure of good judgment that is shown by a firm's past record in handling contracts under similar conditions.

4.—I think the importance of this subject (location of the plant to sources of supply and transportation centers) is self-evident; other things being equal, it is much better for a firm to deal with one in its immediate vicinity in order to minimize the transportation difficulties of the present time. However, under various circumstances it may be more advantageous to deal with a firm that is close to a base of raw material. These are matters that have to be weighed and judged in each individual case.

5.—A firm's business connections and contracts which it has established with vendors of raw material are an important consideration in these times when sources of supply are contracted for many months ahead.

Labor Conditions and Plant Equipment

6.—We all realize that under present-day conditions the labor market has an important bearing upon a firm's ability to meet the promises as to production. The labor market has got to be viewed first from the standpoint of supply. (2) From the standpoint of the quality of the supply. (3) From the reputation of the people in the community on questions of strikes and other labor disturbances. (4) With reference to housing and general sociological conditions, affecting the welfare and happiness of the community.

7.—This (the general character of the building) has particular reference to fire protection, fire underwriter's risk, plant lay-out to facilitate good manufacturing, arrangement of machinery for economical production, and satisfactory working conditions from a labor standpoint.

8.—We have put this subject (character of equipment) last in order, but it is by no means last in importance. Good gears can only be produced by modern machinery properly installed, properly maintained and satisfactorily operated. An adequate supply of cutters, hobbs, and high-speed steel for blading and the necessary assortment of small tools should be on hand. Machines should be placed to permit operation with a minimum amount of vibration. Wherever possible, grinding machinery should be placed on the ground floor. When we are manufacturing gears, we are working within narrow limits, and it is fruitless to suppose that satisfactory results can be obtained in the face of poor equipment and installations. It should be borne in mind that in these modern times heat treatments have a large part in the satisfactory finished product, and the plant that manufactures gears from carbon and alloy steels must contain modern heat treatment equipment, and a thoroughly experienced metallurgist in charge of its operation. We don't want to overlook the fact that the metallurgical end of the business is highly scientific and is based upon exact knowledge and cannot be satisfactorily performed by rule of thumb methods without the use of proper standards of comparison.

"Having settled to our satisfaction that the proposed source of supply fulfills a large number of the above requirements, we are next confronted by the fact that satisfactory gears from a purchaser's standpoint can only be produced as a result of conformity to good practice along the following lines: Design, materials, forgings and castings, heat treatment, machining, hardening and inspection."

After discussing these points in detail the speaker concluded that "satisfactory gears cannot be produced by any but the most painstaking efforts and the higher the requirements for the elimination of gear noises the more we are confronted by the fact that we have much to learn and from a purchaser's standpoint a knowledge of what is possible under present-day methods is necessary in order that purchasing requirements may be reduced or may be made to coincide with the present state of the art."

The Interstate Iron & Steel Co. has secured a building permit for the construction of a one-story open-hearth plant, 97 x 117 ft, at One Hundred and Eighteenth Street and Calumet River, South Chicago, Ill. The structure will cost $70,000.

The Tilting Open Hearth's Future in France

Advantages of This Type—Suggestions as to Proper Design—Steel from High Phosphorus Basic Bessemer Iron

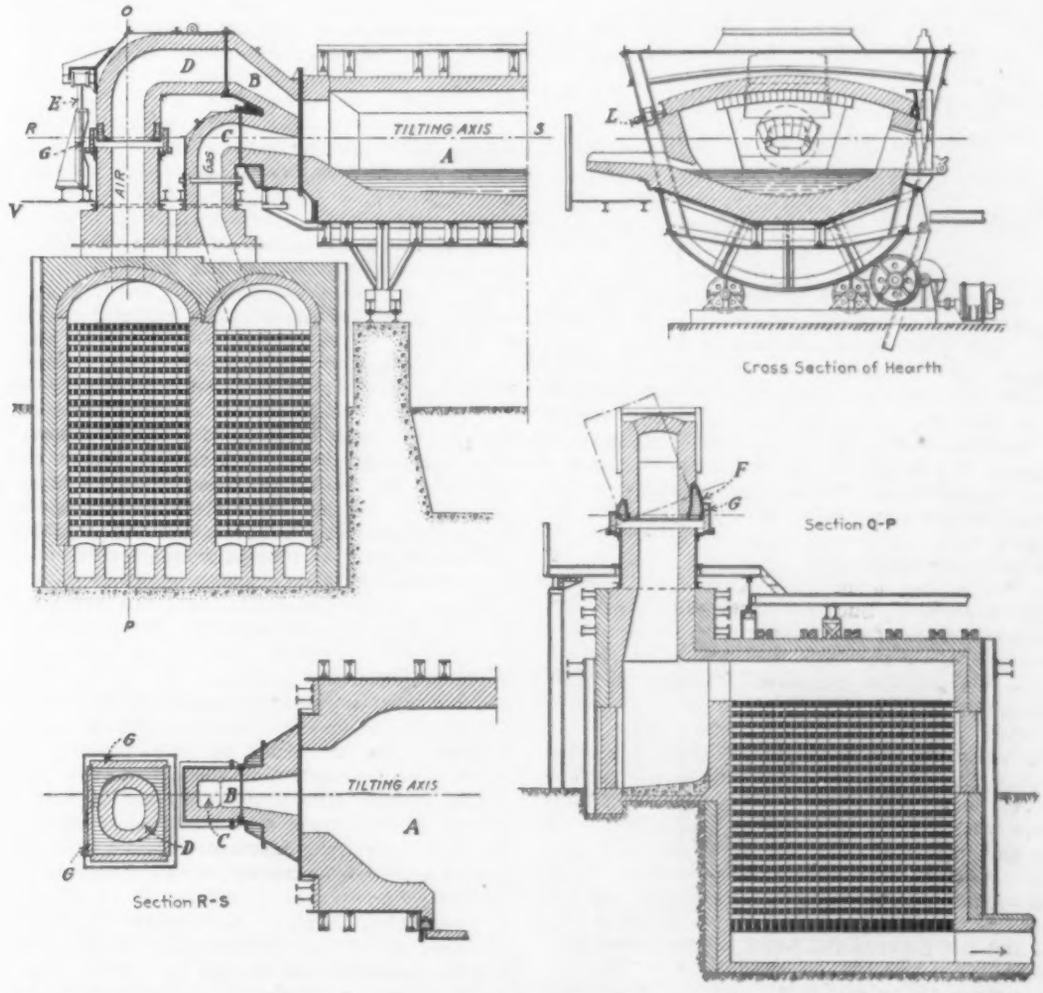
A DISCUSSION of the future of the tilting type of open-hearth furnace in France together with a description of a furnace presenting several new features by P. Jolly appears in *La Revue de Metallurgie* for January, 1920. The writer points out first the superiority of basic open-hearth steel over basic Bessemer steel, and the increasingly large demand in Europe generally for the former kind of material. France, the birthplace of the open-hearth process, has allowed Germany to pass her in number of open-hearth furnaces, which superiority should disappear.

The slow growth of the open-hearth process in France may be due to the practical difficulties of making good steel in stationary furnaces from high phosphorus basic Bessemer iron. Certain processes have been worked out and used for this iron, such as the Bertrand-Thiel and the Hoesch processes, but they do not thoroughly solve the problem and present inconveniences. With a well designed tilting furnace all these difficulties disappear and its use allows steel to be made equal in quality and lower in cost than that obtained in a stationary furnace from low phosphorus iron. With the Hoesch process, for example, the metal must be tapped into a ladle when the major part of the phosphorus has passed into the slag, the tap hole then made up, and the metal again poured into the furnace for finishing. These operations are expensive (upkeep of ladles, loss of time, labor costs, etc.) and there is much loss of heat due to tapping the metal into the ladle and later pouring into the furnace.

Advantages of the Tilting Furnace

If a tilting furnace is used the process is much more simple and economical. No time is lost in tapping the raw metal into a ladle nor in making up the tap hole. When the slag has absorbed the bulk of the phosphorus the furnace is tilted forward and the slag poured into slag buggies placed on a track below. This operation lasts several minutes only, the furnace is turned back and a new slag made to finish the heat. It is not necessary that the first slag be completely removed, the small amount remaining is diluted when the new slag is formed, and the total phosphorus contents of the second slag are low enough so that rephosphorization of the metal in the pouring ladle at the end of the operation need not be feared. After final tapping of the metal the slag remaining in the furnace can be used for the succeeding charge, instead of being thrown away as in the Hoesch process.

From this it is clear that the tilting furnace is necessary to all plants, such as those in the north and east of France, making high phosphorus basic



Special Features of the Lambot Construction of a French Tilting Open-Hearth Furnace, Recently Patented

Bessemer pig iron, and anxious to furnish material of irreproachable and regular quality. Such a furnace is equally valuable when making electric steel and starting with high phosphorus pig iron. In this case it serves as a preparatory furnace, fractions being drawn off for further refining in the electric furnace, and replaced by proper amounts of liquid pig iron. Such a method has been used for more than 10 years with much success by the Arbel works at their plant at Dommeldange.

In regard to upkeep, the tilting furnace is superior to the stationary furnace, for no special precautions are necessary for making up the tap hole, the operation of tapping is very simple and one is sure of not having a hard tap hole which is of importance when making high grade steels. The upkeep of the back wall is easier because the furnace may be inclined and the repair material made to adhere better. The tilting furnace, therefore, presents important advantages over the stationary furnace. It is interesting to remember that the converter was originally stationary and, notwithstanding much increased cost of installation, was made tilting because of increased ease of operation.

There is no doubt that in the future preference will be given to the tilting furnace because it makes the furnacemen's work easier and does not demand the same amount of experience as a stationary furnace; the operations are also simpler and allow increased production. Time is not lost to make up the tap hole, and the hearth is taken care of more easily because it can be completely drained whereas with a stationary furnace there are often holes lower than the tap hole in which steel is apt to remain that mixes with the dolomite or magnesite and prevents good adherence to the hearth.

Design of Tilting Furnaces.

Having thus given what he feels to be the advantages of the tilting furnace, the writer then passes to the consideration of furnace design. In the furnaces as usually constructed an air space is left between the tilting hearth and the fixed port ends. With good regulation gas escapes at this space, and the coal consumption per ton is therefore higher than with good stationary practice. Even with furnaces having removable port ends mounted on rollers that can be brought close up against the hearth the results have not been satisfactory. In a recently patented design all these inconveniences have been overcome, and the heat economy is at least equal to that of stationary furnaces, and it has been used in practice. The special construction has been patented by J. Lambot of Marcinelle Charleroi.

The special features are shown in the illustrations, and are characterized by the combination of the hearth, A, and the ports C and D, joined to the burners B. The whole is brought about in such a way that tilting does not open any joint. The port ends, B, and the air port, D, tilt with the furnace. The gas port, C, is movable and can be easily displaced to take care of the port end. When the furnace tilts this port remains in place in the turning axis. At the side toward the gas burner it is circular and corresponds with a section of the same shape and size constituting a part of the burner. In order to avoid entrance of air at this place and yet leave space for expansion and easy tilting, the joint is surrounded by a metallic band lined with asbestos. This band presses tightly against the joint during melting and working, and when it is desired to tilt the furnace the band is loosened slightly.

The air port, D, is fastened to the port end, B, and at the other end is carried on a roller bearing, E, concentric to the axis of tilting. This bearing is independent of the furnace and serves to maintain the position of the air port, D, in relation to the tilting axis, whatever may be the expansion produced by the working of the furnace. A space is necessary between the regenerator and the air port, to take care of the expansion of the brickwork. This space is inclosed in a frame, G, formed of four movable plates resting in a trench filled with sand to make a gas-tight joint. This frame surrounds a water cooled band, F, which forms the end of the air port, and holds up the brickwork. A tight joint is maintained between the band and the frame by asbestos. The band can move freely in the interior of the frame, G, without air entering or flame passing out. In this whole construction the joints are at places where the flame has a straight course, and where the temperature is less than at the junction between the ports and the hearth. The plates of the frame can be readily removed to examine the joint. The roof rests on one side against a fixed skewback, and on the other against a movable plate, L, kept in place by pressure screws, so that expansion and contraction can be taken care of.

The writer discusses also the advantage of movable and interchangeable port ends, which have not been adopted as practical in this country. G. B. W.

Engineering Foundation Seeks Large Endowment

Based on the generous gifts and high purpose of Ambrose Swasey, Engineering Foundation has since 1915 maintained a liaison between engineers, as represented by the founder and other societies and scientific workers as represented in National Research Council. Practical means for co-operation in research have been set up so that engineers in the numerous branches of the profession may join with physicists, chemists, geologists, geographers, psychologists, doctors, biologists, educators and anthropoligists, in the attack upon problems of common interest and in the exchange of knowledge. Engineering Foundation now seeks to build up its endowment and has issued a statement in substance as follows:

Engineers connected with industrial and financial organizations having great resources can aid by convincing proper officials of corporations that the continued prosperity of our industries depends upon continued progress of research. Since the commercial and industrial establishments of the United States reap the larger proportions of the financial profits arising from scientific and technological work, these same establishments should contribute liberally to the support of research.

Scientists are more largely concerned in research in pure science, the search for undiscovered knowledge for its own sake, the usefulness of which may not become apparent in some instances for many years. Between this most advanced line and the development of specific industrial devices or processes, lies the large field of research in applied science and the industries which especially concerns technologists. In this broad field there is scarcely an item of work in which the engineer in some branch of his practice is not directly interested and concerned. Sooner or later the engineer uses all these results of research in science and the industries.

There are many problems relating to the materials and forces of engineering on which further knowledge is needed. Progress will be made approximately in proportion to the funds made available. The foundation does not plan to build laboratories and conduct research work directly, but rather to stimulate, coordinate and support research work in existing scientific and industrial laboratories, co-operating, insofar as may prove advantageous, with the National Research Council.

Charles F. Rand, 71 Broadway, New York, past-president of United Engineering Society, and of the American Institute of Mining and Metallurgical Engineers, was elected chairman of Engineering Foundation on March 19, to succeed Dr. W. F. M. Goss, resigned. With the collaboration of Mr. Swasey, Mr. Rand is actively seeking additions to the endowment fund which will swell the total to at least a million dollars in the near future. Mr. Swasey's gifts amount to $300 000. The office of Engineering Foundation is in Engineering Societies Building, 29 West Thirty-ninth Street, New York. A booklet giving an account of the Engineering Foundation and its work has been prepared for distribution.

Code Calling Systems in Steel Plants

Application, Advantages, Details of Operation and Electrical Features—Planning the Installation—Psychological Problems and Acoustic Principles

BY VLADIMIR KARAPETOFF*

IN the latter part of the summer of 1919 the writer investigated the various uses of acoustic signals, such as whistles, bells, etc., in large steel plants in Pittsburgh, Ohio, Indiana, and Chicago, and his findings are presented in this paper with particular reference to signals used for calling various persons to the telephone according to a pre-arranged code.

Signals of different kinds have come into use in various steel plants by a natural, unsystematic growth, and without having been carefully laid out according to a definite scheme. Any progressive plant has its engineering, purchasing, and employment departments, where experts attend to those needs in a systematic way. The various signals, however, are often left without any expert attention, in spite of their extreme importance for safety and efficiency in the operation of the plant.

Code Calling Supplements the Telephone

The purpose of a code calling installation is to supplement the telephone system of the works in such a way as to be able to reach a desired person instantly no matter where he may be in the plant at that time. Referring to Figs. 1 and 2, the telephone operator has before her an electric contact device which is connected by wires to horns, bells, whistles or any other desired acoustic devices installed throughout the works and in the offices. When the electric contact is closed in the central mechanism all these acoustic devices sound. Each person of importance in the works is assigned a definite code number, 1-2, 1-3, etc., or with a large number of men 1-2-3, 1-2-4, etc. The device shown in Fig. 1 has 40 different combinations, which are more than sufficient for all ordinary purposes.

The operation of this mechanism is as follows: Suppose the plant manager wants to see the chief mechanical engineer, Mr. A, on important business. He tells the telephone operator to get Mr. A, whether he is in his office or not. The operator tries to get him on the telephone, and if he is not in his office she consults the code list before her and finds that Mr. A's code number is, for example, 2-4. She sets the dial (Fig. 1) so that 2-4 comes opposite the index point shown to the left. Then she pulls on the little handle shown to the right, near the bottom, and lets it go. A spring returns the shaft to its original position, and in so doing the contacts are closed in the required order for the desired call. The horns throughout the plant give two short blasts, then pause for a few seconds, and give four short blasts. The call may be sounded one, two, three, or more times, according to how far the operator has pulled the handle.

As soon as Mr. A has heard his call, no matter where he may be in the works, he goes to the nearest telephone and reports to the operator, who immediately connects him with the manager's office.

The particular device shown in Fig. 1 has a relay incorporated in it, as shown in the lower left hand corner. The coil of the relay is connected to a few dry cells, indicated in Fig. 2; and the copper-carbon contact operated by this relay closes the 110 or the 220-volt power circuit to which the acoustic devices are connected.

With a very large installation it is desirable to subdivide the operating current further by the addition of one or more relays as shown in Fig. 2. The current in each circuit may then be kept within reasonable limits, and wires of smaller size may be used. By the addition of such relays an existing code-calling system may be indefinitely extended as the plant is enlarged.

Assignment of Numbers to Various Men

Having decided to install a code-calling system, the management must further decide to which men in the plant numbers should be assigned. In particular it is desirable to determine in advance the maximum number of individual calls, because the size of the contact-closing device is determined by this number. The following list gives an idea of the members of the staff who should be assigned code numbers:

General superintendent	Electrical superintendent
Chief engineer	Chief of police
Safety engineer	Chief chemist
Master mechanic	Metallurgical expert
Expediter of materials	Fire chief
Superintendent of transportation	Efficiency engineer

Most of these men have assistants and important members of their staff, at least some of whom should be included in the list—making the total number of persons at least twice that shown above. In any case it is desirable to have a few spare numbers available for the following purposes:

a. More than one number should be assigned to each important person, one number signifying, for example, an emergency call from his superior, and the other an ordinary service call. Or else one combination may direct the person to reply by telephone, the other to come to some agreed place.

b. Code numbers may be assigned for temporary use, to an officer of the company, a district manager, etc., not resident in the city where the plant is located when he happens to be in the works and expects an important message or a visitor. Some office employees may have no numbers assigned to them except on rare occasions when they have to go to the plant.

c. For special uses, such as weather signals, election returns, returns of athletic games, etc.

d. To provide for future expansion. The tendency in the existing installations is usually not to assign enough numbers. This is partly due to the novelty of this method of communication and partly to the negligence on the part of the management. No one less than the general superintendent, or preferably than the general manager, should make the first assignment of numbers. If the matter be left to one particular department, say to the electrical department, because the installation and the physical maintenance are in its care, the result is liable to be one-sided. Too many electrical men will probably be assigned numbers in proportion to the other departments, while important non-electrical men are liable to be omitted by oversight. Some men with a "pull" may be omitted at their own request "so as not to be bothered with calls."

Number Assignment Has Psychological Effect

In selecting men to whom numbers are to be assigned, it is well to keep in mind the psychological effect which such an assignment has upon an employee, such as the chief telephone repair man. It adds to his dignity, to his interest in the work; it enables his superior to get him promptly, and thus plan his work more efficiently. It does away with a temptation to loaf with a conscientious excuse that he could not get the transportation man or the order clerk, or could not get a ruling as to whether a line was to be transferred or only repaired. It impresses him with a sense of responsibility of working all the time, because he may be called any minute to give an account of what he

*Professor of electrical engineering, Cornell University, Ithaca, N. Y.

is doing, and because he can get his superior any time that he may need a ruling from him.

The assignment of two or more numbers to certain men also has a beneficial effect, especially if one of the calls means "come to the phone when through with the present engagement." It does away with the resentment or nervousness which some persons would feel in hearing their call while engaged in an important conference. A message as just mentioned would assure them that the call is on a subject that can wait for a few minutes or an hour if need be.

In almost any large plant there are persons of importance who are always confined to a certain part of the plant. Such men as the superintendent of furnaces, superintendent of the coke plant, some office men, etc., usually circulate within a certain assigned

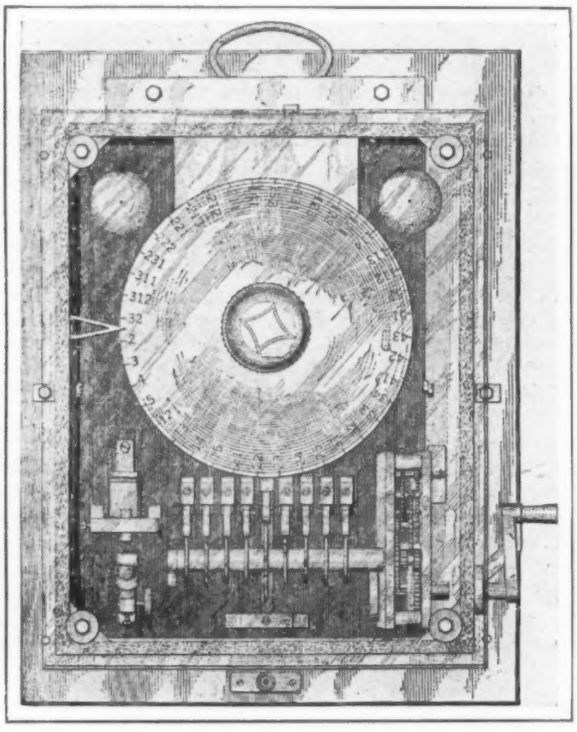


Fig. 1—Electric Contact Device Which Is Connected by Wires to Horns, Bells, Whistles or Other Acoustic Devices Installed Throughout the Steel Works and in the Offices. This instrument has 40 different combinations, each person of importance in the works being assigned a definite code number so that he may be reached no matter where he may be in the plant at the time

area. While they ought to be included in the code-call list, it would be wasteful to sound their numbers all over the plant, including the departments in which they are never to be found.

A sectionalized code-calling installation shown in Fig. 3 solves this problem. For the sake of simplicity only one side of the lines is shown. The contact mechanism *K* is connected to busbars *M*, which in turn are connected to the out-going lines through switches *a*, *b*, *c*, *d*. If it is desired to call a person located, say in section *B* of the plant, the operator closes switch *b* and sounds the call which is heard only in that particular part of the works. For so-called "floaters"—that is, men like the general superintendent or the electrical engineer whose duties call them to any part of the plant, the totalizing switch *f* is used. Closing this switch connects all the outgoing lines to the busbars, and the call is sounded throughout the plant.

With this arrangement many more men may be included in the list with the same limited number of contact combinations in the code-calling device. Thus the number of the superintendent of the coke plant may be *B*-3-4, while that of the man in charge of open hearth furnaces may be *C*-3-4. The combination 3-4 in the mechanism itself is the same while the letter *B* or *C* indicates which of the switches must be closed. Should, on a rare occasion, the superintendent of the coke plant have to go into the steel plant proper, he could leave word with his assistant or a clerk to answer an incoming code call and tell where he can be found.

In addition to the possibility of putting more men on the list such a sectionalized installation has the advantage of cutting down the total number of calls sounded during the day in a particular department; therefore, the calls that are sounded in each department are liable to receive better attention.

Other Uses of Code Calling Systems

While the primary purpose of a code-calling system is to get in touch with a desired person, the same acoustic signals may be used for a number of other purposes, some of which are enumerated below.

1. The most natural additional use for a code-calling system is for sounding fire alarms. There are different possibilities in this connection.

a. If no other fire alarm system has been installed the contact mechanism, Fig. 2, is provided with a switch which connects it at will either to the circuit containing the code-calling devices or to the one containing fire alarm signals. The two kinds of signals must be kept quite distinct; for example, if whistles and bells are used for code-calling, electric horns may be used for sounding fire alarms. Thus the combination 2-3 on the bells and whistles may mean that the assistant mechanical engineer is wanted at the phone while the same combination sounded by the horns might mean "fire in building 23."

b. A special set of fire alarm signals may be dispensed with by using two distinct codes for the two classes of service. For example, all code calls for employees may begin with digits 1 or 2, while fire alarm signals would begin with digits 3 or 4.

c. When a separate fire alarm system is available, the code-calling installation may be made to do a very valuable auxiliary service by conveying additional information and orders, and by enabling the management to get in touch promptly with a desired person needed in fire fighting.

2. One of the most dreaded interruptions that may occur in the modern steel mill is the failure of the electric power. In such an emergency the code-calling system may be made to perform very valuable service. In some cases the failure of the power supply is gradual and the inevitability of a shutdown becomes apparent to the electrical men some time before the switches are actually opened. In such cases a special warning signal will save the plant thousands of dollars and may even save lives. The men at the blast furnaces will immediately know what to do to forestall an accumulation of gases and a possible disaster. The open hearth department, the soaking pits, the rolling mills, will take the necessary measures to save as much metal and labor as possible. Two or three distinct code calls may be used in such an emergency, one indicating that the extent or the duration of the shutdown cannot be determined yet, another indicating a short interruption, and a third announcing a serious and prolonged trouble in the electrical power supply. These calls may be followed by other calls indicating, for example, that the power supply would be resumed within half an hour, or that it could not be restored the same day. Not only will such calls save time and money, but they will relieve the electrical department of the annoyance of numerous inquiries over the phone, and in person, just when every member of this department must be devoting his whole energy to the restoration of the service.

3. A modern steel plant usually has an elaborate watchmen's and police organization and the code-calling system is undoubtedly a great help in managing this widely scattered force in an emergency. A prearranged code-call will promptly bring members of this force to an agreed place for concerted action, or would indicate even more in detail what they are to do according to the nature of the emergency. Special directions may also be sent to the night watchmen from the main gate. With the wiring available throughout the plant for code-calling an attachment may be added by means of which a night watchman could signal back his whereabouts.

4. Some steel plants are located on rivers subject to rapid floods with resulting damage to the equipment and danger to lives. There may also be cases where a break in a dam above the plant may bring a disaster

to the plant. A special code-call would give a warning to every one concerned, and lives and property may thus be saved.

5. The code-calling system may also be used for sounding the time of the beginning and ending of work, change of shifts, the correct noon time, etc. For this purpose an accurate clock is used, which closes the circuit of a relay at desired instants. This relay disconnects the manual code-calling device from the line and cuts in a special contact-making mechanism

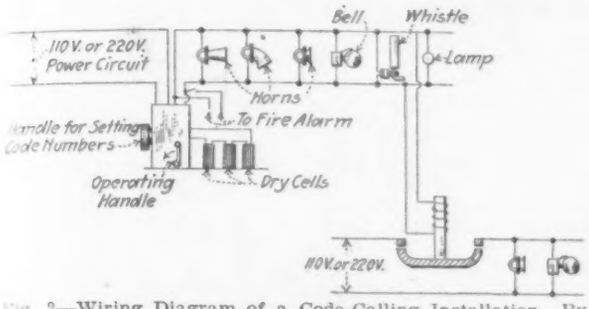


Fig. 2—Wiring Diagram of a Code-Calling Installation. By the use of relays an existing code-calling system may be indefinitely extended as the plant is enlarged

which sends a series of electrical impulses through the acoustic devices. A succession of short blasts, or strokes of bells, so produced, continues 15 or 20 seconds. This is a signal entirely different from a regular code call and could not be confused with it.

6. In these days of concerted effort to promote industrial good will, the possibility of utilizing the code-calling system for general news must not be overlooked. A few simple items of general interest transmitted throughout the plant day after day will go a long way in showing the workmen that the management is willing to do something that it does not have to do—something that is like a direct message from the main office to their humblest employee. The weather signal is probably the most important item of general interest. During the baseball season the scores or the results of important games may be transmitted in the same manner. Before an important election or a pending decision of Supreme Court of far-reaching importance a notice may be posted throughout the works telling which code combination will be sounded for this or that result or decision. Such small signs of attention and courtesy will make the worker feel that the management considers him a human being, and the plant will have a little home atmosphere for him. Emotional foreign workers will be particularly responsive to such a universal language.

Attention Paid to Signals

Audible signals used for code-calling in a particular building must be chosen with reference to the noises prevalent in that particular building. The signals used must not be any louder than is necessary in order to be heard. Any excessive intensity may distract other employees from their direct duties. Anyone accustomed to audible signals or to noises to which he is supposed or obliged to listen knows that there is quite a distinct range within which such signals or noises are distinctly heard without being annoying, or even without one being conscious of them. It is the problem of an acoustical engineer to select the number and the location of signals so as to come at least roughly within this range. Thus the above-mentioned ideal may be expressed in the following three propositions:

1. Each person must hear his number distinctly no matter where he may be at the time within the plant.
2. He must be conscious as little as possible of other persons' calls and should not be unduly distracted by them.
3. Persons to whom no call number has been assigned must not be annoyed by acoustic signals.

Actual experience shows that by careful planning based upon previous experience, and upon a clear understanding of the laws of acoustics and of the psychology of hearing, an expert can always come quite close to satisfying the above requirements.

Experience with properly selected acoustic signals indicates that the required sound intensity of a signal may be considerably reduced by properly selecting the pitch and character of its tone. The following two rules may be stated with a considerable degree of certainty:

1. Always select a signal of a pitch within the maximum range of sensitiveness of the human ear and at the same time as distinct as possible from that of the predominating noise in its vicinity. Use a high-pitched signal in a shop with a low pitched, rumbling noise, and use a low pitched signal in a shop with high pitched, screechy noises.
2. Use a discontinuous signal, like a single stroke bell, in a location with a continuous noise, and use a continuous tone signal, like a horn, in a location with noises of percussion type like a riveting shop.

The actual efficiency of signals installed in accordance with these rules is almost unbelievable. The writer remembers in particular his standing near a large steam turbine in a steel plant where the noise was so deafening that not a word shouted by his companions could be heard. At the same time the sound of a comparatively small single stroke bell used for code-calling purposes, mounted on the wall quite a distance away, could be heard very distinctly and the number of strokes easily counted.

Steel mills are by no means noisy plants from an acoustic engineer's point of view, and even judging by our everyday standards, the noises are quite moderate in all but a few locations. Particularly in modern plants with wide spaces between buildings and an orderly handling of transportation of materials, the problem of an acoustic installation presents very few difficulties.

The writer wishes to emphasize again that in order

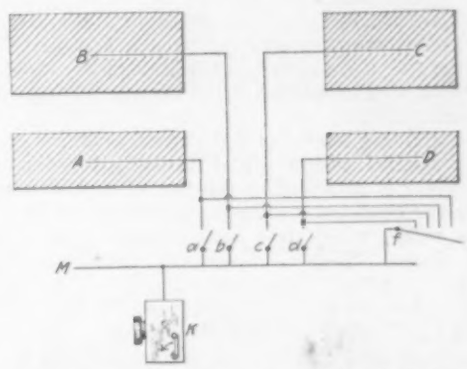


Fig. 3—Diagram of a Sectionalized Code-Calling Installation. If it is desired to call a person located in section *B* of the plant, the operator closes switch *B* and sounds the call which is heard only in that part of the works

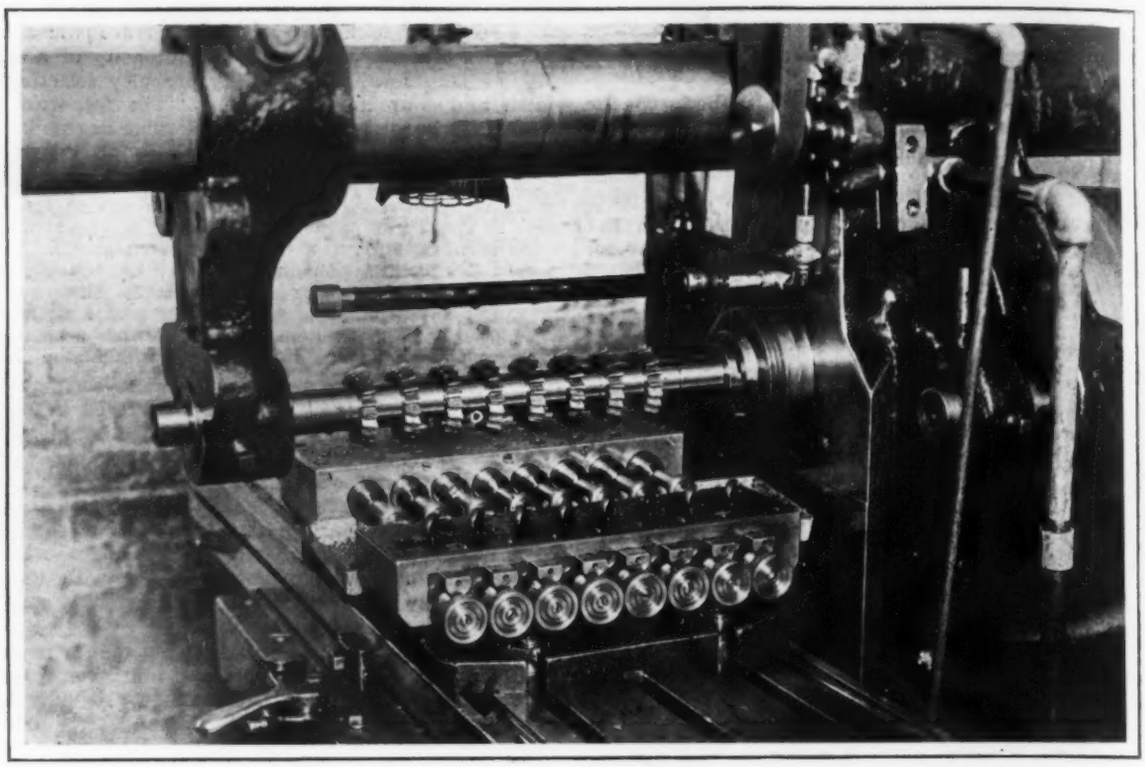
to function properly, such a system must be carefully laid out by a specialist and the signals employed in each department must be selected with reference to the prevalent character and intensity of the noise in that department.

Steel Exports to Burma

WASHINGTON, May 25.—Iron and steel products, not including hardware and machinery, constitute one of the leading imports into Burma, according to a report from Consul Lawrence P. Briggs, who is at Rangoon. The value of these imports amounts normally to nearly $5,000,000 per year. Including machinery and hardware, the total normal value of articles imported would be nearly double this amount and would hold second place to cotton goods among the imports of Burma.

"With the development of Burma's mineral and industrial resources, of which there is great promise, the demand for these products is bound to increase," says Mr. Briggs. "The principal iron and steel products imported into Burma are sheets and plates."

W. R. McDonough & Co., Citizens Building, Cleveland, are now the sales representatives of the Ward Tool & Forging Co. in the Cleveland territory.



The Work-Drivers to Be Seen Against the Head Stock of the Dividing Head Contain Cube-Shaped Sockets Which Fit the End of the Work, Thus to Eliminate the Use of Dogs. The drivers are fitted to the live spindles in such a manner as to permit a small degree of flexibility; thus the necessary adjustment can be made if the work is a little off center.

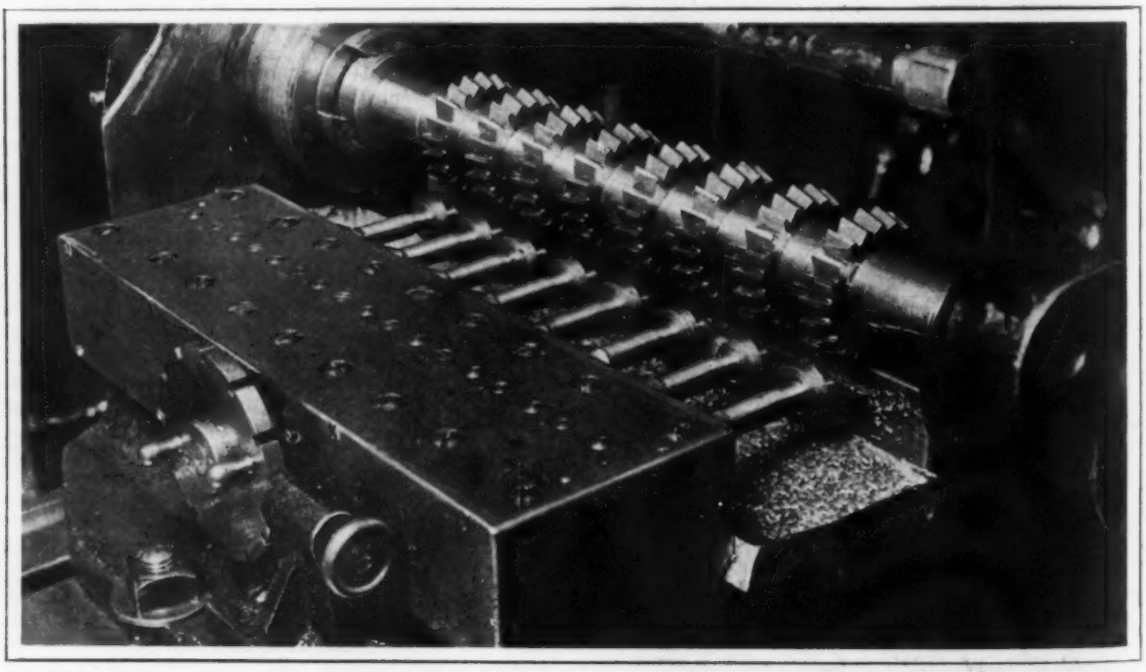
Multiple-Spindle Dividing Head

A multiple-spindle dividing head, designed for production work, has been put on the market by Scully-Jones Co., 80 East Jackson Boulevard, Chicago. The device is noteworthy because of the simplicity of its construction, the interchangeability of its parts, and the use of special work-drivers instead of dogs to hold the work.

The dividing head has eight spindles and is equipped with a special purpose dial for rapid indexing. A work-driver is attached to the end of each live spindle. The driver contains a cube-shaped socket to fit the end of the work, which has been machined to a square prism shape. This arrangement makes the use of dogs unnecessary. The drivers are so fitted to the spindles that they are flexible, thereby allowing for adjustment if work be a little off center. Any part of the dividing head can be readily replaced and the spindles, bushings and work-drivers are interchangeable. The user, therefore, can get along with one set of repair parts for all spindles.

Dials and work-drivers are furnished to suit the needs of the purchaser. The principle of the latter is that of a key, and any shaped socket can be supplied which will hold the work to the spindle.

Dividing heads embodying the same principles of construction as the one shown in the accompanying illustrations can be furnished with 2, 4, 6, 10 or 12 spindles, according to the wishes of the user. The device will cut spiral as well as spur gears.



The Dividing Head Is Equipped with a Special Purpose Dial for Rapid Indexing. All of the spindles, bushings and work-drivers in the device are interchangeable, and for this reason a user need carry only one set of repair parts

Recent Developments in Oxygen Cutting*

Metallography of Iron and Steel Under the Action of a Melting Flame—Cast Iron Cut by Preheating the Oxygen

—BY STUART PLUMLEY AND F. J. NAPOLITAN—

THE most interesting development which has occurred recently in connection with cutting is without doubt the successful cutting of cast iron. More than a year or two ago there were rumors, heard now and then in the industry, of some genius who stated that he had cut, or could cut, cast iron. These rumors were not given much credence because it was thought that in most instances the man who believed he had cut cast iron had in reality cut something else which he thought was cast iron.

About the same time the engineering department of the Davis-Bournonville Co., Jersey City, N. J., began experiments with a view to learning more of the basic principles underlying cutting, particularly with respect to cast iron. This paper outlines theories and principles which may explain some of the conditions well known by men practised in cutting, but which had never been clearly understood by the majority of cutters.

While we are rather skeptical of the commercial value of a cast-iron cutting torch, yet there are undoubtedly occasions when the cutting of cast iron would be of great value.

Corners of a Cast-Iron Stone Crusher Head, Which Were Beveled with an Oxy-acetylene Cutting Torch, Preparatory to Welding. Each corner piece represents a cut 4½ in. thick, 17 in. long, with an area of 76 sq. in. The cuts were made in 6½ min. each, using 24 cu. ft. of oxygen and about 4 cu. ft. of acetylene. The kerf was about 5/16 in. wide at the top and bottom

Experimental work was done with a torch having a good many different tubes leading to the head so that almost any combination of gases at varied pressures might be obtained. From these experiments interesting theories have been evolved pertaining to the reactions which take place in cutting, together with their relation to our success in cutting cast iron. We can actually cut cast iron and we do it by preheating the oxygen.

Effect of Carbon on the Cutting Action

From the ease with which wrought iron is cut we may conclude that an aggregate of ferrites combines with oxygen with greatest avidity, and permits the propagation of a cut with least interruption. As the carbon content is increased there is a material change in the nature of the metal. In place of the preponderance of ferrite grains we recognize the formation of cementite, and its union with some of the ferrite to form pearlite, the original mass of proeutectoid ferrite rapidly diminishing in prominence. As we should anticipate from the nature of pearlite, no material change is noticed in the performance of these alloys under the cutting torch. Of course, an ultra-precise consumption test would probably indicate a lowering of the efficiency coefficient, but, from all appearances, no unusual difficulty is experienced in cutting carbon steels up to about 80 to 90-point carbon. But here a definite transition is indicated by a distinct laboring of the cutting torch. While the torch will begin a cut with practically the same effort, and proceeds to completion without interruption or unusual delay, yet the kerf is wide and ragged and undeniably distinguished from that of a mild steel cut. It is recognized practice now to preheat the piece to be cut to a black or dull red heat, when the impediment, whatever it was, seems to have been entirely eliminated.

But let metallography explain the sudden change of properties of the steel. As the carbon content of the hypoeutectic steel was increased, the proximate mass of pearlite increased, and the proeutectoid ferrite correspondingly diminished in volume until eventually a point was reached where all of the cementite and ferrite existed in the stratified or laminated relationship of pearlite. This state is recognized as existing where the carbon content is between 80 and 90-point—the approximate analysis of pearlite is yet undefined. As the carbon content is further increased there appears a constituent that we know as proeutectoid cementite, in fancy the cementite which has been ejected from the pearlite growth. It is circumstantial that the presence of this pro-eutectoid cementite is directly responsible for the increasing difficulty of our cutting. But why did preheating of the steel before cutting make such a remarkable difference in the results? To be sure, the rise in temperature might affect the stability of any martensite, troostite or even sorbite that might have existed, but the temperature was too far removed from the Ac 3-2-1 point to affect the characteristics of the pearlite. And surely the proeutectoid cementite was unchanged—and it was this same constituent that we blamed for the difficulty.

Again, as the carbon content is substantially increased an equivalent interference with cutting is apparent, until, when the carbon content approaches 2.5 per cent, cutting becomes so labored as practically to cease, and no amount of preheating short of incipient fusion will permit it to propagate. The metal is now termed "cast iron," and a microanalysis indicates that in addition to the presence of a certain amount of pearlite and proeutectoid cementite, as well as certain foreign and, to our discussion, unobtrusive substances, we recognize the presence of the final and most stable state of carbon—graphite. The pearlite constituent exercises a favorable influence upon the operation of cutting, and the pro-eutectoid cementite, while it impedes cutting, is readily compensated by a slight preheating, but the graphite presents an entirely new problem.

Melting Point of Slag Theory a Fallacy

We might digress from the subject enough to prove the fallacy of at least one of the stereotyped explanations of why cast iron cannot be cut—that the melting point of the slag is appreciably higher than the melting point of cast iron. A micro-analysis of the structure of an average cast iron—that is, a gray cast iron of about 3 to 4 per cent carbon—would indicate a structure identical with that of a hypothetical steel

*From a paper recently presented before the American Welding Society, New York. The authors are with the Davis-Bournonville Co., Jersey City, N. J.

of the same carbon content, except that some of the carbon seems to have been precipitated as graphite. But should that identical pour of cast iron have been cast against a cold iron mold or otherwise chilled, the carbon would not have been precipitated as graphite and we should have had what we shall call a chilled cast iron, or a white cast iron, and it would actually have been a hyper-eutectic steel. Such alloys are not uncommon, and the fact that operators have been able to cut them with no extraordinary effort has been responsible for innumerable false claims that cast iron has been cut. Unfortunately, the nomenclature of steels and irons is not clearly defined, and undoubtedly a chilled cast iron is but an extension of the hyper-eutectic series.

The melting point of an iron-carbon alloy is a constant of its composition, whether, in the solid state, the metal exists as a typical cast iron or as a steel. Long before the point of fusion the carbon and iron exist in one relationship, that of austenite. The conditions affecting the pouring of a melt of cast iron would determine the final state of its constituents—and we might as readily produce a gray cast iron or a chilled white cast iron—the carbon as graphite or the carbon as in cementite. In either event the melting points of the resulting products would be identical. Chilled cast iron can be cut with comparative ease, notwithstanding that its melting point is lower than the melting point of the slag produced. It is evident, then, that the melting point of slag is not responsible for the difficulty encountered in cutting cast iron.

Physical State of Carbon the Factor

We had concluded that while the existence of pro-eutectoid cementite appreciably retarded cutting, the presence of but a comparatively small amount of graphite completely prevented cutting. The phenomenon, if it were true, is unique for it would presuppose the incombustibility of carbon. Science contradicts us immediately. In fact, our own welding practice belies us. We might point to the reaction accompanying the removal of carbon from automotive cylinders by the oxygen method, or, leaving our immediate field, we might mention the explosive combustion of carbon in ordinary gunpowder. We are forced to conclude, then, that far from retarding the combustion of the steel matrix, the graphite of cast iron should actually assist it.

We investigated further to determine how much graphite influenced cutting. We obtained specimens of so-called malleable castings of the characteristic "black heart" structure. Such a structure is made in this country by the annealing of white cast iron in which all of the carbon exists in cementite or pearlite, the latter in some cases entirely removed. The treatment decomposes the cementite to precipitate the carbon in minute particles, differing from the graphite of gray cast iron in their extreme subdivision and uniform distribution throughout a ferrite matrix. In making a black heart casting an oxidizing packing is used in this country so that while the core is that of a black heart casting the mass near to the surface is ferrite. We removed this shell of ferrite so that our materials indicated, under the microscope, a uniform aggregate of ferrite and temper carbon. By preheating this piece to a dull red heat, it was cut with the characteristics of a high carbon steel. Then we were satisfied that carbon as such did not prevent cutting, but that the physical state of that carbon was responsible. As plates of graphite cutting was prevented, but as finely divided particles cutting was scarcely impeded.

Reconsidering our previous observations in the light of this development, we began to substantiate our first logical hypothesis. We found, to summarize, that ferrite permitted most readily to be cut. Pearlite with pro-eutectoid ferrite did not materially affect the conditions. A completely eutectic composition first suggested a transitory stage. The existence of pro-eutectoid cementite retarded cutting, but preheating of the piece to a red heat readjusted the conditions so that cutting was again as efficient as in the case of ferrite. As the comparatively low temperature produced by preheating was insufficient to affect any change in the physical state of the constituents of the alloy, we were forced to conclude that the addition of heat units affected a definite constant, which we assumed was the heat of combustion of the iron, as the two forces were of like characteristics. Then a constant result from a variable made axiomatic the existence of a second variable. Our second variable, then, we concluded was the cooling effect of the stream of cutting oxygen, and a further thought suggested a third variable in the time of chemical reaction between the iron and oxygen. The preheating flames ignited the steel, the cutting oxygen produced combustion, and the propagation of the cut was the natural consequence. But as the carbon content was increased the speed of the reaction was materially lowered; however, the velocity of cutting oxygen to insure a continuity of oxygen and slag to the bottom of the cut, was a constant. Then, eventually, a point was reached where the rate of combustion between the iron and oxygen was so slow that the heat units liberated from the reaction were dissipated to such an extent as no longer to ignite adjacent masses of metal, and cutting ceased. By preheating the piece before cutting we add to the forces on the weakening side of the equilibrium, and cutting once more obtained. The heat units so obtained compensated for the relatively less heat units liberated from the chemical combination of the iron and oxygen in a definite unit of time.

From the existence of pro-eutectoid cementite there emerges tempering carbon and ultimately graphitic carbon. While the pearlite and pro-eutectoid cementite are readily compensated, the graphitic carbon effectively prevents cutting by the ordinary means. No addition of heat units short of incipient fusion, by preheating the object, restores the equilibrium. We cannot strengthen further one side of our equilibrium, but we have not attempted to affect the other side. We have made no attempt to reduce the cooling effect of the cutting oxygen. We therefore experimented in this direction and found that we could so effectively preheat the cutting oxygen that we could restore the equilibrium without preheating the object.

Summer Course for Executives

A two weeks' summer course in industrial organization and management will be conducted for the fifth consecutive year by the Pennsylvania State College, Pa., Aug. 9 to 21. The course is primarily planned to meet the needs of manufacturers, superintendents, employment directors, foremen, accountants, etc., such subjects being discussed as factory organization, manufacturing methods, employment, industrial betterment, planning and production control, purchasing, cost accounting and kindred subjects. The greater portion of the time is devoted to practical installation of methods, using the equipment of the college, which is especially designed to handle this type of work.

Fitzpatrick Gets Cool Reception

An attempt by John Fitzpatrick to organize the steel workers in the South Chicago district met with poor success in a meeting which he called recently. A year ago, before the steel strike, Lincoln Hall, Ninety-first Street and Commercial Avenue, South Chicago, was crowded with more than 2000 enthusiastic workers. All joined the union. On May 13 only 150 gathered there, although handbills had been distributed among 25,000 workmen. The bills announced that the meeting had been called by the National Organizing Committee of the Iron and Steel Workers of America. It was also stated that a succession of weekly gatherings would be held until the union included every man working in a steel plant in the district.

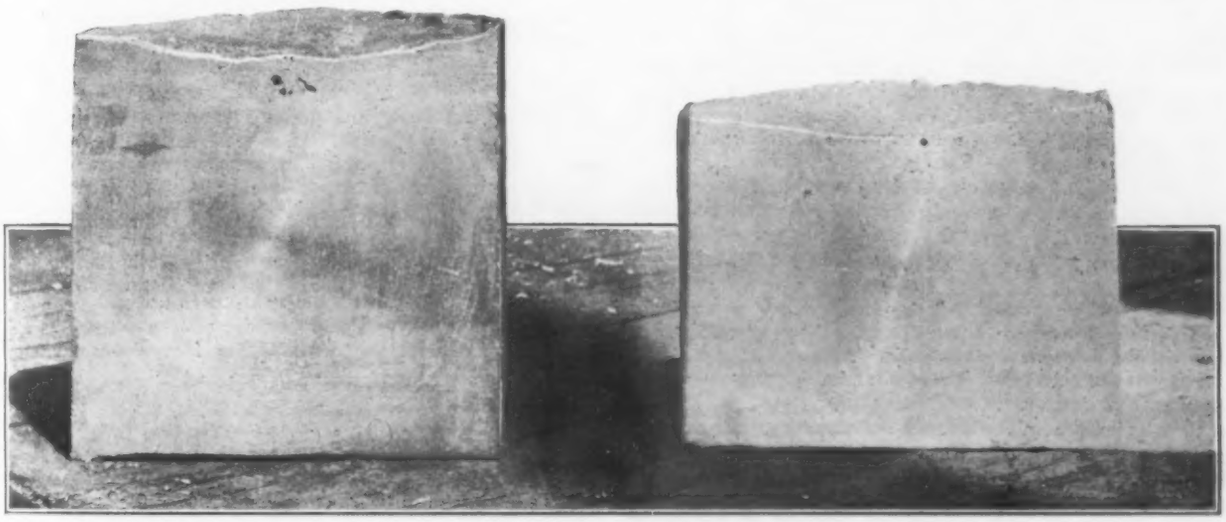
The United States Civil Service Commission announces an examination by mail for safety engineer at $2,500 to $3,000 a year. Applicants should apply for form 1312, stating the title of the examination desired, to the Civil Service Commission, Washington, or the secretary of the United States Civil Service Board at the nearest custom house.

Individual Ingots for Tires and Wheels

Suitability as Compared with Multiple Steel Ingots—Conditions Essential to Their Use—Special Pipe Eliminator

THE question of multiple or individual ingots of steel for certain products, such as tires or wheels, was discussed before the meeting of the American Iron and Steel Institute last fall by Lawford H. Fry, Standard Steel Works, Burnham, Pa. The paper was entitled "The Manufacture of Ingots for Locomotive Tires and Rolled Wheels" and was an exposition of the process used by the author's company by which individual ingots are made which successfully meet the metallurgical and mechanical problems involved.

Mr. Fry, in introducing his subject, said that the large majority of tires are made from acid open-hearth steel, while rolled wheels are made from both the basic and acid open-hearth. The first step is to select an ingot or a portion of an ingot of a weight to make the tire or wheel and, after heating, to compress this in the direction of its longitudinal axis, at the same time punching a hole through the center. The resultant piece, says Mr. Fry, is generally similar for tires or wheels except that for wheels the hole is smaller in diameter and in some cases the hub is partly formed in this operation. An abstract of the paper follows:



Sections of Octagonal Individual Steel Ingots

Two Types of Ingots Compared

Ingots for tires and wheels are classified into multiple ingots and individual ingots. The difference lies in the fact that the individual ingot is cast of a size to make a single tire or wheel, while a multiple ingot is sliced, at right angles to its long axis, into a number of blocks each of which is formed into a wheel or tire.

Metallurgically considered, the two types of ingots are differentiated by the principles involved in the elimination of piping and segregation. Multiple ingots are designed to concentrate these defects in the upper quarter of the ingot, which is discarded after slicing the lower portion into blocks, while individual ingots are designed to eliminate piping almost entirely, to reduce segregation to a minimum, and to place these defects so that they are completely removed by the punching operation in the first process of manufacture.

Early Individual Ingots

While the use of multiple ingots is fairly well generalized, the use in America of the individual ingot for tires and wheels is confined at present to the Standard Steel Works Co. It is octagonal in section and is currently made with diameters of 12, 14, 16, 18, 20 and 22 in. across the flats. The heights poured in each diameter range from about 60 to 100 per cent of the diameter. This, with the six above mentioned diameters, gives ingot weights ranging from 250 to 1900 lb., each ingot being of a weight to produce a single tire or wheel.

The distinguishing feature of the individual ingot is the fact that it does away with all top cropping, the only discard necessary being the central core removed in punching the bloom. This is less than 3 per cent of the weight of the ingot. In comparing the yield of individual and multiple ingots it must be remembered that this punching loss is the same in both types, so that while in the individual ingot the total loss is the furnace loss plus the 3 per cent punching loss, in the multiple ingot it is furnace loss plus 3 per cent punching loss plus 10 or 20 per cent top discard plus a possible bottom discard. This result is obtained by eliminating piping and concentrating segregation. One of the illustrations shows longitudinal sections of two typical 16-in. ingots. The steel is practically solid throughout, which is the result of maintaining the top of the ingot fluid so that it can follow all shrinkage as it takes place and prevent the formation of cavities. To secure satisfactory ingots it has been found necessary to have well made, dead melted steel; to have a properly designed mold, and to apply a suitable carbonaceous material to the top of the steel as soon as it is poured.

A short history of the development of the short ingot in America will show the difficulties inherent in the process and the methods used to overcome them. The use of individual ingots for tires in Europe dates back a considerable number of years, but was not taken up in this country until the year 1908. At that time the attention of S. M. Vauclain, Baldwin Locomotive Works, was called to the economy in steel which was possible with this type of ingot. Some samples of European ingots were obtained and experiments started at the Standard Steel works under the superintendence of John P. Sykes.

Sections of the early ingots are shown in another illustration. No. 10-A is the original European ingot, which was bottom poured in a closed mold. It shows a heavily honeycombed interior, and though satisfactory tires have been produced from such ingots in Europe, they were not adapted to American practice.

Sections of Early Individual Ingots, the First One on the Left, 10*A*, Being an Original European Ingot

A modified form of this design is shown in 10-B. This, though better, is still honeycombed. Another form, 10-C, is hardly so promising; 10-D poured from the top in an open mold marks an advance, but it is marred by the large pipe cavity due to the top having frozen too rapidly. The problem of eliminating the pipe by vertical section a truncated cone on a short cylinder. keeping the top of the ingot fluid was finally solved by applying powdered coke or graphite. The form of ingot then adopted is illustrated in another illustration. The horizontal cross section is circular and the The shop name for these ingots was "chocolate drops." The ingots in this view have been parted by sawing from two opposite sides and fracturing and the picture is not entirely clear as to the extent of the pipe. The ingot marked B-5 has a rather larger pipe than is desirable, while the two ingots marked B-2 have narrow pipes which would be removed in punching. Ingots of this type proved so satisfactory and so economical that the use of the multiple ingots for tires and wheels was abandoned by the Standard Steel Works.

Since the introduction of the individual ingot further improvements in its design and manufacture have been made. The circular cone section has been replaced by an octagon cross section with a straight vertical side as in the first illustration referred to, and the material now used to keep the top hot is a special compound described below. Many investigations of the short octagon ingots made with pipe eliminator have shown that the freedom from piping shown is typical and can be secured in regular practice. Segregation is also confined within satisfactory limits. The silicon and manganese analyses have revealed no appreciable variation at any of the points. Carbon, phosphorus and sulphur were found outside a narrow triangle having its base at the top surface of the ingot and its apex on the longitudinal axis. This triangle corresponds, in the full ingot, to a cone which is removed in punching. Surveys of completed tires and wheels confirm these conclusions as to the removal of injurious segregation during manufacture.

Essential Conditions for Short Ingots

Too much emphasis cannot be laid on the fact already mentioned that to secure individual pipeless ingots of uniform composition three conditions are essential:

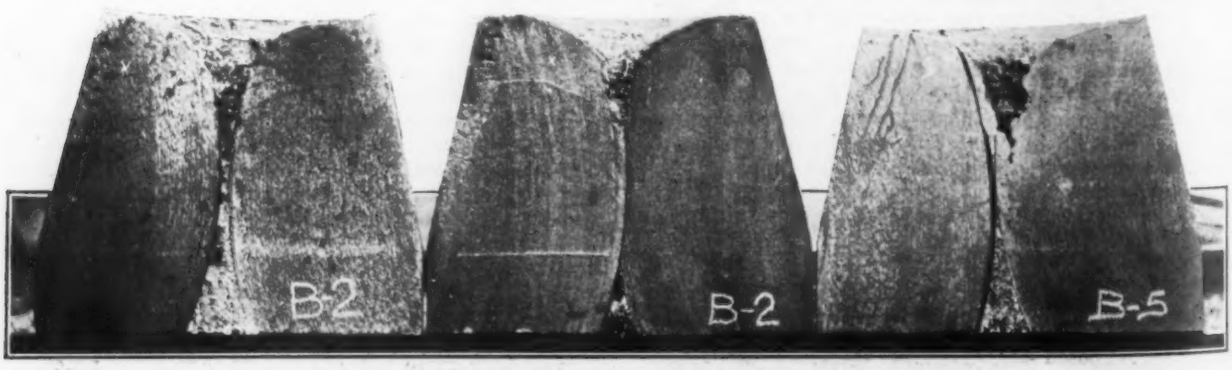
Well made dead melted steel.
Correct ingot mold proportions.
Proper carbonaceous material for the ingot top.

Individual ingots have been made with both acid and basic open-hearth steel, and could be made with electric steel if occasion arose. This is not equivalent, however, to saying that "any steel will do." It is essential that the steel be well made, properly deoxidized, and dead-melted so that it will lie quietly in the molds without any tendency to wildness. That is to say, the evolution of gas by the steel in the mold must be reduced to the minimum possible. The ingots should be carefully inspected for piping, rough tops or other defects. In particular any ingots showing signs of having boiled or risen in the mold should be rejected, as they will be honeycombed to a dangerous extent. If the open-hearth practice is kept up to the mark and care is taken with the pit practice, individual ingots can be made to pass the necessarily severe inspection, with rejections well under 1 per cent.

It is important to have the mold walls thick at the base and thin at the top so that the chill effect is greater at the base, and cooling progresses from bottom to top of the ingot. It is also essential that the height of the ingot should be in proper proportion to the diameter. If the ingot is too flat the segregated area will be wide compared with the punch diameter, while too high an ingot will tend to give excessive piping. It has been found desirable to keep the height between 60 and 100 per cent of the diameter of the octagon.

Carbonaceous Material for Hot Tops

A satisfactory material has only been arrived at by a continuous process of trial and elimination. In the manufacture of multiple ingots with hot tops, it has long been a common practice to add powdered coke, charcoal or coal to the upper surface. In the case of such ingots where a considerable discard is made so as to reject recarburized metal, satisfactory results can be obtained with such materials. In the case of individual ingots, however, the problem is much harder. The work required of the material is quite complex and the difficulties encountered with other materials have been such as to narrow the choice to the compound referred to above, which is known as pipe eliminator. The material used must keep the ingot top hot and at the same time leave it with a smooth, uniform surface. It must also prevent a recarburization of the surface. It has been found that to give these results the pipe eliminator must be finely divided and must carry a small amount of volatile matter so that it will ignite rapidly on application to the steel. There must also be present sufficient inert material or ash, which, after ignition, forms a blanket between steel and elimi-



Sections of the Form of Individual Ingots, Known as "Chocolate Drops," at Present Adopted as Standard

nator, preventing undue absorption of carbon by the steel. It is further necessary to have a considerable proportion of slow burning fixed carbon so that the top will be maintained hot during the solidification of the ingot.

Open-Hearth Pit Practice

When the pouring conditions are considered it is obvious that there is a good deal of difference between the "set-up" for bottom-poured multiple ingots weighing from 5000 to 12,000 lb. and individual top-poured ingots with an average weight of about 900 lb. The grouping of the long bottom-poured ingots is well known and requires no description, but the arrangement of open-hearth pit floor adopted by the Standard Steel Works Co. may be of interest. The 50-ton ladle is carried on a gantry so as to just clear the ingot molds, which are set up on five lines of base plates. The height is kept as low as possible to avoid splash. The ladle has two stoppers spaced to correspond to the base plates, so that with two operators a brace of ingots can be poured at once. The sequence of operations is: The base plates are carefully inspected and any defective bottom bricks repaired or replaced; molds of the size ordered are set up and a chalk mark made on the inside of each to show the height to which the steel is to be poured to give the weight required; the steel is poured to the chalk mark, and a scoopful of pipe eliminator added; when the ingots have set the molds are lifted off, and as soon as the ingots are cold enough to be magnetic they are transferred by magnet to the classifying shed. Accuracy in the weights of the ingots is essential, and with an average weight of about 900 lb. the tolerance allowed is 10 lb. under and 25 lb. over the ordered weight.

As an instance of good practice in this direction the following record of a heat from one of the 75-ton furnaces at Burnham is given. The layout in this pit differs slightly from that outlined above, but the principles are the same. In the heat referred to, 172 ingots of 975 lb. ordered weight were poured, and of these only two were outside the tolerance allowed. It is obvious that to obtain results such as this good ladle and stopper conditions are necessary.

Pittsburgh Valve, Foundry & Construction Co. Dedicates New Pipe Shop

The Pittsburgh Valve, Foundry & Construction Co., Pittsburgh, has just completed the erection of a modern pipe shop in which the necessary equipment is being installed, part of it from the old pipe shop, which is being abandoned, but much of it new equipment. The new shop is of mill type construction, steel and brick, 84 x 274 ft., with a cement tile roof, making it fireproof. This roof is equipped with 18 skylights, providing ample light and ventilation for the entire building. On the east side of the building is a gallery 84 x 200 ft., and this gallery has a penthouse to accommodate acetylene generators for acetylene pipe welding purposes. The building will be equipped with three Shaw electric traveling cranes of 5-tons capacity each which are to be installed from the old shop.

The new pipe shop will contain cutting and threading departments, welding department and banstoning and bending department for putting flanges on pipe. It also contains complete equipment of toilet facilities for the employees.

A large amount of cutting and threading equipment will be installed in the new building, coming from the Landis Machinery Co., Waynesboro, Pa., also four pipe-bending furnaces, being designed and built by the company, which will be capable of bending pipe up to 30 in. in diameter and 40 ft. long. There will also be a large pipe-filling machine for filling pipe with sand before bending.

The company is also building an extension to its present warehouse, of mill type construction, 75 ft. long, giving a warehouse 100 ft. x 274 ft. This warehouse was made necessary in order to more conveniently handle the material in and out of the pipe shop, also to afford more storage facilities. The hauling of material into the pipe shop and warehouse will be done largely by electric storage battery trucks.

The Pittsburgh Valve, Foundry & Construction Co. has more work on hand at the present time than probably ever before in its history. It is doing the entire pipe work in the large power plant being erected by the Cheswick Power Co., Cheswick, Pa., a subsidiary of the Duquesne Light Co., and has ready for shipment a large amount of pipe and valves of all kinds for the Tata Iron & Steel Co., in India. Other large contracts on hand will give the concern all the work it can turn out in the next three or four months.

The completion of the new pipe shop gave the company an opportunity to cultivate closer personal relations with its employees and was the occasion of a gathering on Wednesday evening, May 12, that brought its entire force of employees, with wives and other guests together. More than 2000 persons were present, when the shop was dedicated. This event was under the auspices of the Valve Club, a social organization composed of employees of the company. The building was beautifully decorated with American flags and the flags of our Allies, and a brass band was in attendance. The amusements included moving pictures, cards and dancing, and there was a buffet luncheon. William Price, president of Duquesne National Bank, Pittsburgh, and a director of the company, made a five-minute address which was splendidly received by his audience. He spoke of the occasion as being one that should occur more often, as it was a splendid means of cementing the friendship that should exist between employers and employees.

The Pittsburgh Valve, Foundry & Construction Co. is a designer and builder of valves, fittings and piping appliances of every description for rolling mills, steel works, blast furnaces, power houses coal and coke works, etc. also steam, gas, water, air and hydraulic piping. The officials are: Chas. A. Anderson, president; J. Roy Tanner, vice-president and general manager; James D. Robertson, vice-president and manager of sales; Samuel G. Patterson, secretary and treasurer; A. Roy Carson, auditor.

Chrome in the Caribbean Countries

Regular shipments of high-grade chrome ore from Costa Rica continue to come to the United States. This operation is financed and managed by interests connected with the United Fruit Co. It is reported that the deposits are extensive and that a continued and enlarged production is planned.

The Cuban chrome properties continue to ship to this country, but in diminished tonnage. Most of the Cuban ores present a difficult metallurgical problem and so far few effective treatment plants have been established in the country. The Cuban operations are largely in the control of Americans and further investment by American interests is planned.

A chrome deposit near Coro in the State of Falcon, Venezuela, partly developed before the war, will soon be reopened to ship to the American market. The ore yields about 35 per cent C_2O_3 and will require concentration.

The continued high prices for chrome ores and the high ocean freights from the New Caledonian deposits in the South Pacific have induced the development of these nearby chrome deposits, so that the American market is likely to have an adequate supply of this special ore independent of the European controlled deposits of Turkey and the South Pacific and convenient for transport to the Atlantic industrial centers where 90 per cent of the chrome is consumed in the steel and chemical industries. This situation should be satisfactory to the chrome users in default of a satisfactory domestic supply being available in localities which permits of its transport to market at a reasonable freight cost.

The Carling Turbine Blower Co., Worcester, Mass., formerly located at 72 School St., is in larger quarters at 104 Harding St.

Design of Open-Hearth Furnaces*

Examples of Good and Bad Regenerators of Both the Vertical and Horizontal Type

—BY A. D. WILLIAMS—

THE ordinary type of vertical regenerators is so constructed that it should work in a rational manner. That is, the high temperature gases descend regularly and subdivide among the vertical passes according to their temperature, while the air and gas which is being heated subdivides into the ascending

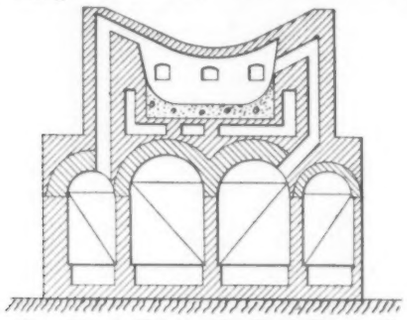


Fig. 21—A Frequently Used Form of Regenerator. Not enough space between checker brick and arch.

passes in the same manner. This is why the idea of Schenwelder, of dividing each of the checker chambers into two compartments, in order to secure uniform

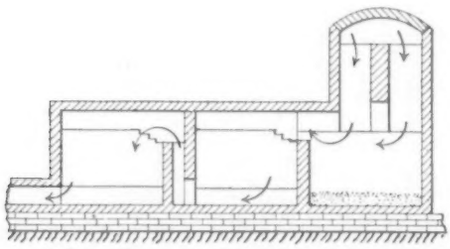
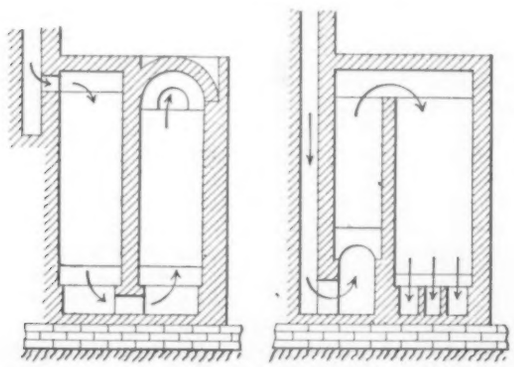


Fig. 22—Type of Construction Used in a 40-ton Furnace by Steelton Plant of Bethlehem Steel Co.

working, is fundamentally wrong. He introduced into regenerator construction a superfluous complication, and for this reason his design has been abandoned.

Nevertheless, it should not be concluded from the



Figs. 23 and 24—In Each of These the Gas Circulation Is Wrong in One-Half of the Regenerator

above that any sort of a vertical regenerator will always work in a regular manner. Vertical regenerators have an inherent tendency to uniform working, but poor design may cause them to work in a very irregular fashion.

For example, Fig. 21 shows a very common form of regenerator, in which the current of gas from the vertical flues leading to the ports jetted upon the top of the checkerwork. It is very evident that in this case that it will be impossible to secure uniform working. The checkerwork can only work in a uniform manner when sufficient space is provided below the arch over the chamber for the velocity of the gases to become zero or very close to zero. The eddies, which are formed under too low an arch, disturb the gas distribution and prevent uniform working. In order to secure uniform working it is necessary to provide sufficient space to absorb these eddy currents, in order that

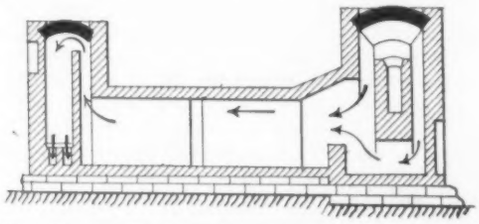


Fig. 25—H. H. Campbell's Attempt at a Horizontal Regenerator Which Had to Have a blower as an Assistant

the gases may enter the checkerwork with a very low velocity below the arch over the chamber. As an example of a very good type of regenerator we have shown the chamber of a 40-ton open-hearth furnace at the plant of the Pennsylvania Steel Co., Fig. 22.

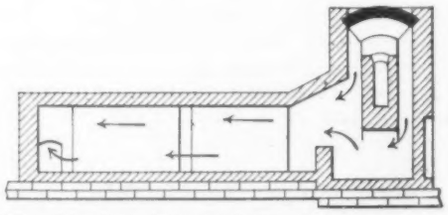


Fig. 26—Suggested Changes Which Would Have Worked Better, But Horizontal Checkers Are to Be Avoided

From time to time vertical regenerators are designed which disregard the fundamental principles that a current of hot gases in cooling should pass downward, and a current of air or gas which is being heated should pass upward. Figs. 23 and 24 show such construction.

In each of these cases the current of gases changes its direction of flow from upward to the downward, or vice versa. Thus in Fig. 23 the gases which are giving off heat enter at the top and flow to the bottom of the checkerwork (in the correct manner) and then turn and flow from the bottom to the top of the second chamber (in an incorrect manner); in Fig. 24 the gases which are giving off heat enter at the bottom and rise to the top (in the incorrect way) then they flow downward (in the correct manner).

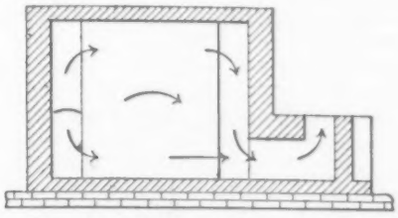
Horizontal Regenerators

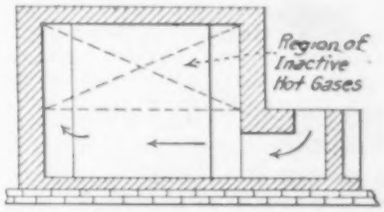
Horizontal regenerators have a bad reputation and there is nothing surprising in this, because in the design of this type of regenerator is displayed a gross

*Translated from "Fours à Flammes." The article forms part of a series that has appeared in the following issues: Jan. 1, proportions of the hearth; Jan. 8, flow of gases within the furnace; Jan. 29, port and roof design; Feb. 12, March 18 and April 29, regenerators.

disregard of the rules governing the subdivision of gaseous currents. Take, for example, the regenerators of the celebrated furnaces designed by H. H. Campbell, which could not be forced to work well, Fig. 25.

In effect, in these regenerators, the hot gases arrive and pass out of the upper part of the chamber. It is evident that in this checker chamber the gases flow in an inverted channel and, if the depth of the flowing stream is less than the distance from the arch to the bottom of the chamber, it will not touch the latter. [It may very readily happen that the conductive area of the checkerwork will be sufficient, in the author's opinion, to cause the lower portion of the checker to reach a high temperature, but at the same time the frictional resistance to the flow of the gases and air will usually be so great that this design of checker will not work without forced draft. Horizontal recuperators are subject to this same defect and it is difficult to secure good working unless the passages are very short.]





Figs. 27 and 28.—Designs by a German Constructor or Designer. Bad design hot gas pocket at top

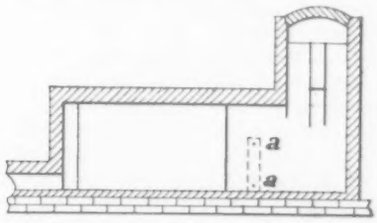


Fig. 29.—Rational Construction of Horizontal Generator

It is comparatively easy to correct these regenerators in a manner which will cause them to work uniformly. Fig. 26 shows the correction or change which should be made. [This change, however, does not affect the frictional resistance of this type of checkerwork.] The hot gases enter the top part of the chamber and leave the chamber at its bottom; the height of the chamber h may be calculated according to the formula of Prof. Yesmann in the same manner as the height of the flues leading to the reversing valves; in this way it is possible to design these chambers of such a height that the lower free surface of the current of gases will be at the level of the bottom of the chamber.

The checkers designed by Dalen (a well-known German designer of furnaces) show a construction equally erroneous, Figs. 27 and 28. Here the hot gases are conducted into the checker chamber, not at the top, but below half the height of the chamber. Such a regenerator heats the gas nicely, Fig. 27; but it works very inefficiently, because the heated gases are very light and the hottest gases are trapped in the upper part of the chamber and cannot pass out to the flues, and the upper portion of the checker does not do any work at all and forms a pocket filled with immobile heated gas.

Fig. 29 shows a horizontal regenerator constructed in a rational manner. The wall a a indicated by dotted lines, may be removed as it is useless.

The construction shown by Fig. 22 is very good; in this there are two vertical regenerators placed side by side in place of a horizontal regenerator. The correct direction is given to the flowing gas currents. The main defect of these regenerators is due to the frictional resistance which they offer to the passage of the gases.

(To be continued.)

In a new publication of the Bureau of Standards, Scientific Paper No. 376, "Critical Ranges of Nickel Steels," the thermal critical ranges of some of the industrially important nickel steels have been investigated by the method usually employed at the Bureau. It was found that the Ac_3 transformation is more sharply displayed at slower rates of temperature change, within limits, and that the end of the Ac_3 range, as interpreted, is the fundamental criterion of heat-treatment temperatures. Curves are given to show the effect of carbon on the Ac ranges of carbon steels and the effect of nickel on the Ac and Ar ranges of 0.40 per cent carbon steels. The effect of nickel and carbon on the end of Ac_3 is also estimated.

Ag Cooling curve of hot gases passing through a cold checker.
Bg Cooling curve of hot gases passing through a checker with too long a heating period.
Cg Cooling curve of hot gases passing through a checker after it has absorbed its maximum amount of heat.
Aa Heating curve of cold gases passing through an over-heated checker.
Ba Heating curve of cold gases passing through a checker with too long a cooling period.
Ca Cold gases passing through a cold checker.
Db Cold checker prior to heating.
Eb Checker initial heating curve. The upper portion after becoming heated transmits heat to lower portion by conduction.
Fb Checker over-heated in upper portion. Heat is transmitted by conduction to raise temperature of lower portion.
Hb Over-heated checker prior to cooling.

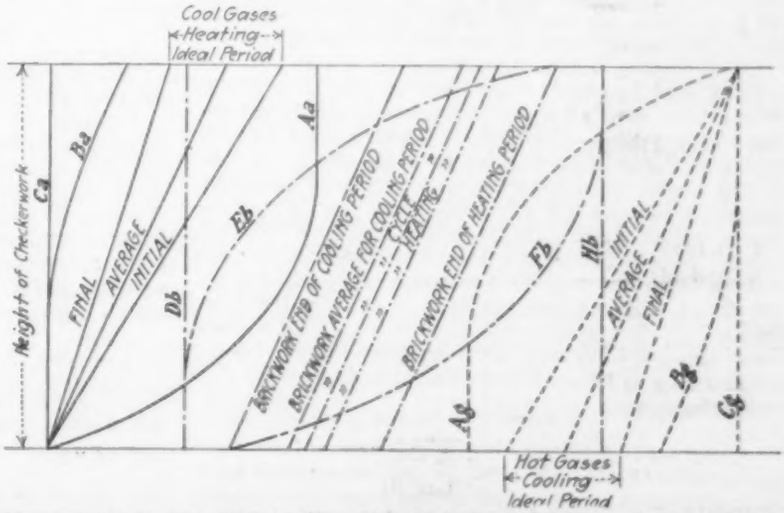


Fig. 30—Curves Showing the Temperature Changes in the Hot Gases Cooling, the Cool Gases Heating and the Checker Brick. Those curves showing these temperature changes during the normal or ideal period or cycle are indicated by the legends. The abnormal cycle or the changes due to over heating and over cooling are marked with reference letters. The latter condition is the one that occurs when a cold checker is heated in starting

RESTRICTION OF CREDIT

Policy Aimed at Non-essentials Outlined at Meeting of Bankers in Washington

WASHINGTON, May 25.—Restriction of credit for non-essential purposes during a period of approximately four months was planned at a conference of 50 representative bankers of the country, composing the advisory council and Class A directors of the Federal Reserve banks with members of the Federal Reserve Board. The conference was the most important thus far held on the credit situation, and while no drastic orders were formulated requiring arbitrary action in the curtailment of credit, yet a program for voluntary co-operation by the banks was outlined, which will vitally affect the business and industry of the country.

The bankers and Government officials were of the opinion that the situation will right itself within the four months' period if the banks and the public co-operate along the lines laid down. They realize, however, that the present expansion of banking credit is unprecedented and that unless there is some contraction the financing of the fall movement of crops will present insurmountable difficulties.

There was no disposition to interfere with legitimate industry. In fact, all plans formulated were with a view to increasing production of essentials. The discussion relative to essentials and non-essentials brought out a desire to restrict the financing of purchases by installments of such things as automobiles, action along this line not being designed to interfere with the automobile industry in view of the fact that the plants are unable to supply the demand.

The full responsibility for the restriction of credit was thrown upon the individual banks of the Federal Reserve system. It was held that an undue shock upon industry would be caused by any effort of the Federal Reserve Board to draw a line between essentials and non-essentials, and that it would be difficult for the 12 Federal Reserve banks to keep a close check on the situation. The individual banks, however, it was pointed out, are under no restrictions which prevent them from refusing to make loans in cases where they believe it would not be to the advantage of the community.

Liquidation of 10 Per Cent of Loans

A statement of the views of the conference as prepared by a committee and transmitted to the banks urges that each bank liquidate at least 10 per cent of its total outstanding loans. In contracting loans the banks are urged to discriminate carefully between those for essential and non-essential purposes, preference being given food production. The purpose of this recommendation primarily is to force business concerns which are holding stocks of goods for higher prices to put them on the market at once. Pressure of the banks upon the merchants is expected to bring further price cutting, such as has occurred recently.

As a further means of contracting credit the conference was insistent that the Federal Government should defer until after the crop movement all expenditures except those absolutely necessary, and that its borrowings should be reduced to a minimum. It was further urged that States, counties, and cities defer any contemplated issuance of bonds, and that no public improvements which are not essential should be made during the next four months. The bankers took the position also that construction should be postponed by individuals and business concerns to the greatest possible extent during the next four months. Individuals were urged to increase their deposits in the banks, and to carry as little money with them as possible.

Decreased Production

A decrease of 10 per cent in production during the past year in the face of a 25 per cent increase in bank loans was emphasized as one of the alarming features of the situation. Governor W. P. G. Harding, of the Federal Reserve Board, pointed out to the conference that the country cannot continue to advance prices and wages, to curtail production, to expand credits and to attempt to enrich itself by non-productive operations and transactions without bringing on a real crisis. The problem as viewed by Gov. Harding is to check further expansion and to bring about a normal and healthy liquidation without curtailing essential production and without shock to industry, and, as far as possible, without disturbing legitimate commerce and business.

The transportation situation was held chiefly responsible for delaying the seasonal reduction in commercial loans which usually takes place during the first quarter of the year, this liquidation being considered essential in order that banks may be prepared to meet the demands made upon them during crop making and harvesting season. The traffic tie-up preventing commodities from reaching the markets has prevented this usual natural liquidation and commercial loans have steadily increased as a consequence. A committee of the bankers conferred both with the Interstate Commerce Commission and the Shipping Board relative to the traffic situation. O. F. S.

Serious Steel Shortage in Detroit

DETROIT, May 22.—One of the most important factors in the present production decrease among Detroit factories is the steel shortage, which continues to grow more serious each day. The other factors are the attitude of labor, high wages and the railroad breakdown. Production at present is somewhat below 60 per cent of normal and the number of unemployed is estimated at about 40,000, an increase of about 10,000 over estimates of a week ago.

The steel shortage in Detroit is mostly of steel bars, nuts, bolts and rivets, strip steel, and to some extent sheet steel.

The recent proposal to solve the railroad equipment situation by diverting 50 per cent of their required allotments from the automotive industries to the railroads has aroused a storm of disapproval, the automobile manufacturers feeling that while they are willing to go the limit in helping out the railroads, they should not be forced to give up more of their share of steel than are other industries.

An actual cut of steel supplies to 50 per cent, it is certain, would seriously increase Detroit's already large army of unemployed.

As matters stand, a small proportion of the plants now have only supplies that will last from three to six weeks, and after that period, drastic production decreases will be in order unless larger supplies from day to day are forthcoming. Many factory inventories, although high in value, are grossly out of balance, with large sums invested in some kinds of steel products and parts, while bins built to hold other equally vital steel materials and parts are empty or nearly so.

Foreign Commerce Declines

WASHINGTON, May 25.—Both exports and imports declined during the month of April. The figures as just issued by the Bureau of Foreign and Domestic Commerce show that the total value of exports was $135,000,000 less in April than in March, the total in April being $684,000,000 as against $820,000,000 in March. The exports in April, 1919, amounted to $715,000,000, and the exports for the 10 months' period ending with April amounted to $6,734,000,000, as against $5,700,000,000 in the same period ending in April, 1919.

Imports in April totaled $495,000,000 as against $524,000,000 in March and $273,000,000 in April, 1919. Imports during the ten months' period ending in April were $4,254,000,000, an increase of $1,780,000,000 over the amount of $2,474,000,000 in the ten months' period ending April, 1919.

Directors of the Slick-Knox Steel Co., Sharon, Pa., have changed the name to the Sharon Pressed Steel Co., effective June 24.

Interesting Test of Comparative Production

Cleveland Employees Agree to Turn Out as Large Product in Eight Hours as in Nine or Return to Old Schedule—Cincinnati Machinists' Strike Is Failing

AN interesting test of comparative production in a shop under a 9-hr. and 8-hr. day is being made by the American Multigraph Co., Cleveland. During and after the war period this company operated its plant on a 10-hr. schedule. Last November the hours of work were reduced to nine and the company found that its employees did as much work in nine hours as in 10, and that it had lowered its production costs on some items when operating on a shorter schedule.

Recently the employees through their congress asked that the work-day be reduced to eight hours and a shorter day was approved by the senate, composed of officers of the company and heads of departments. The men through their congress guaranteed that production under the 8-hr. day would equal that set for 10 hours, and have agreed to go back to nine hours at the same daily wage if after a six months' test records show that production is not up to the guaranteed mark.

The company agreed to the plan because its policy is to pay for production and not for hours of work, even though a large share of its employees are still working at a day rate. One factor that led the company to agree to a further reduction in the working hours without a change in its day rate was the excellent showing the employees have made while working nine hours. Comparing production under a 9-hr. day in 1920 with a 10-hr. day in 1914, the company found that, taking 25 principal products as a basis, its employees produced these products in 31 per cent less time during the shorter working day. The improvement in production is attributed entirely to greater efficiency on the part of the men and no part of it is credited to any change or improvement in manufacturing process. It will be noted that the comparisons are made with a pre-war period of 1914, and before the period of industrial unrest that has resulted in a noticeable slackening in work in many plants, and that the standards for work set for 1914 will be used as a basis for determining whether the employees make good on their guarantee to do as much work in eight hours as they formerly did in 10 hours.

The 8-hr. day was put in effect May 10 and records of operation will be compiled every month during the six-month test period. The working hours will be from 7:30 a. m. to 4 p. m., except on Saturday when the plant will close at noon. Piece-work rates will be unchanged. Piece-workers working overtime will be paid time and a half of their day rate for the time lost because of the lunch period. However, no lunch time will be allowed until the overtime has amounted to two hours in excess of the regular day. The night force will stay on a 10-hr. schedule, but their hourly rate will be changed to agree with the new hourly rate of the day employees and a 20 per cent bonus for night work will still be paid. Time and a half will be allowed for overtime over eight hours and for Saturday afternoon. However, overtime work is first to be taken up with a joint committee of the senate and congress before being authorized, this giving the committee a chance to determine whether overtime is necessary because the men are not keeping up production or for other reasons.

Station Agents Omit Strike Authorization

Provision of strikes to settle wage and working disputes were eliminated from the by-laws and constitution of the Order of Railroad Station Agents at its seventh biennial convention held last week at the Fort Pitt Hotel, Pittsburgh. That strikes are obsolete and the Esch-Cummins law provides a better means of settlement was the opinion of the delegates. In place of the strike clause was inserted a provision authorizing the president and committees of the order to carry grievances over wages, working conditions or other disputes to the Railroad Labor Board, if necessary, and failing to reach a settlement with the board, to appeal to highest Government officials. E. H. Morton, president of the organization, said it was the intention to revise its constitution completely and provide for the settlement of differences of any kind without strikes. It is said the association contains 65,000 members located all over the country, and it is the first labor organization to eliminate the strike provision from its constitution.

Changed Attitude at Detroit

DETROIT, May 24.—In the face of threatening unemployment on a vast scale, labor in Detroit and Michigan appears to be scurrying for shelter. Impending strikes no longer threaten, scores of wage disputes have been speedily settled during the past week or so, and in every other manner labor is preparing for the worst by following a policy of "sitting tight."

Somewhere between 25,000 and 30,000 men are idle in addition to the 10,000 floaters who are estimated to exist in Detroit at present.

Rumors that have been widespread through the city as to a supposed agreement among manufacturers to shut their plants arbitrarily from a period said to be from 30 to 90 days, for the purpose of hiring men back at wage reductions approximating 20 per cent, have probably had much to do with the change in the attitude of labor. It is probable that the rumors grew out of published statements to the effect that lack of materials and transportation facilities "complicated by the attitude of labor" might necessitate general shutdowns in the various branches of industry for the periods named.

Whether or not the rumors have any basis in fact, it is true that many of the larger plants have laid off men, as is evidenced by the increase in unemployment. The manufacturers all agree that the layoffs are due entirely to the lack of materials and transportation. In several cases where men were laid off a limited number were taken on again at lower wages. This, however, is accounted for as only the natural result of a flooded labor market.

Novel Buying Plan

The Graton & Knight Mfg. Co., Worcester, Mass., manufacturer of leather belting, has adopted for its workers a plan of co-operative buying and thrift, with a view to reducing the cost of living. Such employees as desire will set aside each week $2 or more, either by direct payment or by deduction from the pay envelope. In the autumn a committee will decide what commodities shall be bought through the purchasing department, such as coal and potatoes, which will be distributed among those who have entered into the thrift plan, according to the amounts of their savings. The employees are accepting this offer in large numbers.

Rapid Advance of Wages

Magnus W. Alexander of Boston, Mass., managing director of the National Industrial Conference Board and consulting engineer on economic problems for the General Electric Co., in an address to the members of the Cincinnati Chamber of Commerce on May 14, declared that wage increases had been greater than the rise in the cost of living since 1914. The budget of the average family of five should be as follows: Foodstuffs, 43 per cent; shelter or rent, 17 per cent; clothing, 13 per cent; heat, light and fuel, 6½ per cent;

sundries, 20½ per cent. On this basis, he found that the cost of living for the average working family, taken for the country as a whole, from July, 1914, to April, 1920, had risen nearly 97 per cent. In this rise, food increased 100 per cent, rent 50 per cent, clothing 180 per cent, fuel lighting and heat 50 per cent, and sundries 83 per cent. The speaker called attention to the increased wealth of the wage earner as a whole as shown on the one hand by the enormously increased sales of such luxuries as furs, silk goods, high-priced shoes, automobiles and costly clothing, and, on the other hand, by the increased deposits of wage earners in the savings banks. In 1914, savings amounted to $400,000,000, and in 1920 these figures had been increased by more than $1,000,000,000.

Homes for Workers

Manufacturing interests of the Mahoning Valley have organized the Niles Housing Corporation, capitalized at $600,000, to provide homes for industrial workers at Niles, Ohio. It is planned to build houses and sell them on a deferred payment basis. Directors of the company are all identified with the manufacturing interests of the Valley, with plants in or adjacent to Niles, as follows: J. B. Kennedy, chairman Brier Hill Steel Co.; J. W. Deetrick, second vice-president Republic Iron & Steel Co.; J. D. Waddell, president Mahoning Valley Steel Co.; L. C. Wilkoff, secretary Youngstown Steel Car Co.; T. E. Thomas, president Niles Firebrick Co.; D. J. Finney, president Standard Boiler & Plate Iron Co.; E. D. Thompson, secretary-treasurer Stevens Metal Products Co.; Lloyd Booth, president Falcon Steel Co., and A. J. Bentley, treasurer Ohio Galvanizing & Mfg. Co. Officers elected are A. J. Bentley, president; J. D. Waddell, vice-president; Lloyd Booth, treasurer, and D. S. Perry, secretary.

Cincinnati Strike Failing

CINCINNATI, May 24.—Conditions in the machine tool industry of Cincinnati, where a machinists' strike is in progress, continued to improve during the past week. No new strikes were reported, and in fact, a number of men who were out returned to work. The Oakley colony is, with the exception of the one small shop previously noted, still unaffected, and as it seems impossible for the leaders of the strike to induce the men in these plants to leave their positions, it is a foregone conclusion that the strike has failed of its object. With the slackened activity in industries occasioned by the railroad strike, and the difficulty of securing other work while the strike is on here, many of the strikers are beginning to think that they have made a mistake, and are applying for their old positions. Employers are holding firmly to their position already announced of refusing to grant the demands of the men, and it is expected that the end of the strike will come within the next few weeks.

The May number, the first issue of the *Journal of the American-Polish Chamber of Commerce and Industry* in the United States, contains in its 32 pages interesting information on Poland and several articles by men well known in their fields. There is an article on the "Transportation Facilities for Trade in Poland" by François de St. Phalle, vice-president Baldwin Locomotive Works and president American-Polish Chamber of Commerce; "Poland Remembers," by Prince Casimir Lubomirski, minister of Poland to the United States; "Poland's Needs To-day and Her Promises for the Future," by Stanislaw Arct, purchasing delegate of Poland, and several shorter articles on trade questions.

Representatives of industrial interests in the Mahoning and Shenango Valleys have agreed to endorse a resolution favoring a 6 per cent advance in freight rates by the railroads. It is felt the carriers of the eastern region have shown clearly the urgent necessity for additional revenue to enable them to operate their roads efficiently and enlarge present facilities so as to provide adequate transportation.

In the Field of Labor

Efforts to create dissatisfaction among workers at the General Electric Co., West Lynn, Mass., plant are not meeting with success. The 6000 union machinists employed were recently asked to vote on the question of striking in protest against a time system installed for the purpose of determining manufacturing costs and selling prices. Only 1400 voted, many of these against strike. The company recently was obliged to reduce its working force because of the lack of certain raw materials.

The Whitin Machine Works, Whitinville, Mass., textile machinery, not only has provided garden plots for employees, but will plow, fertilize and harrow the land, free.

In order to keep the city from being embargoed by the railroads, manufacturers of Hamilton, Ohio, have organized their own switching crews to assist railroad officials now handling this work. There are still a number of switchmen out on strike at Hamilton, but freight movement is reported as satisfactory. Up to date none of the plants of that city has been affected, and it is hoped, with the arrangements now made, that the railroads will be able to keep the yards clear.

The Victor Co-operative Club of the Victor Saw Works, Inc., Springfield, Mass., held a banquet at the Bridgway Hotel, that city, Wednesday evening, May 19. Each department reported on the work accomplished to date this year, and all pledged themselves to continue to co-operate with each other to the greatest possible degree.

In order to assist in relieving the present acute condition of the housing problem in that district the Union Steel Casting Co., Pittsburgh, has contracted for 10 houses to be built at Aspinwall. These houses will be ready for occupancy by Oct. 1, and are primarily intended for sale to employees of the company.

The union foundries of Boston and vicinity have adjusted rates so that employees will receive $7.20 for an 8-hr. day from May 15 to Nov. 15.

About 160 employees of the Woonsocket Machine & Press Co., Woonsocket, R. I., went out on strike May 4, demanding the following: an 8-hr. day, 90c. an hour, elimination of piece work and overtime.

The American Screw Co., Providence, R. I., has been obliged to lay off almost a third of its employees owing to the lack of steel wire, a condition brought about by the railroad transportation situation.

Opposed to Stock Dividend Tax

YOUNGSTOWN, OHIO, May 24.—Corporations in the Mahoning Valley contemplating the issuance of common stock dividends may be deterred from action by the threat of a 10 per cent tax on such issues as the prohibitive nature of such a tax would make it impossible for the stockholders to pay it, according to financial leaders. Based on stock dividends which have been planned by leading iron and steel producers in the Youngstown district, the proposed tax would require $10,000,000 or more to be paid in cash to the Government.

The corporations, it is pointed out, are in no shape to assume the burden, while if the tax falls on the shareholder, the situation is even worse. In the present straitened condition of the financial market, it would be impossible for individuals to borrow money to pay the tax, and they would be compelled to sell part of their holdings to meet it. It is generally held in the Valley that the proposed tax is excessive.

The Precision & Thread Grinder Mfg. Co., manufacturer of the Multi-Graduated Precision Grinder, announces that the United States patent on the grinder was issued May 1.

The Liberty Ordnance Co., Bridgeport, Conn., castings, etc., has changed its corporate name to The Morris Metal Products Corp.

Track Scales for Light and Heavy Service

A track scale embodying new features has been developed by E. & T. Fairbanks & Co., St. Johnsbury, Vt. Specifications recently adopted jointly by the American Railway Association, the Bureau of Standards, and other associations make necessary such changes in the design of scales on the market up to this time, that the new scales in accord with them are not interchangeable with the old scales. While changes were being made that were sufficient to destroy the interchangeability of the new and old scales, it was decided to go further and remove incongruities in design that have been present in scales in the past.

A feature of the new scale is the departure from the use of the customary I section levers, the double web section being used throughout all levers of the scale. L. R. Boyer, sales engineer of the Fairbanks Co., explains that in designing scale levers it has been common practice to assume that the load is applied at the center of each bearing and is transmitted along the center line of each connected lever. The connections between levers of the standard I section must be made between pivots projecting from both sides of the levers. If the load on both sides is not equal, or if there is the least warp or horizontal deflection of the lever, a torsional strain is produced which levers of I section are not calculated to resist. Loads applied to a track scale in ordinary car weighing are frequently greater on one side than the other, with the consequence that the pivots are unequally loaded and torsion set up in the levers.

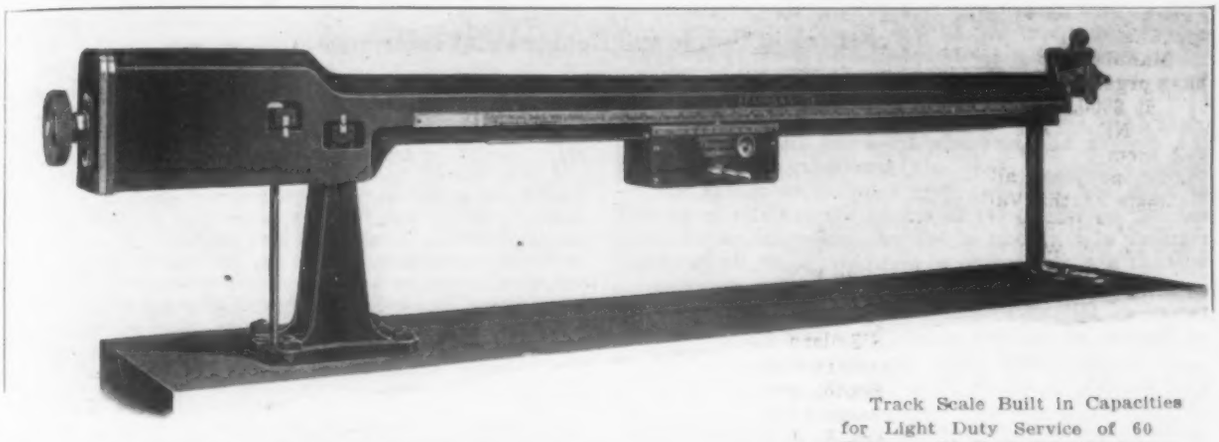
In this new scale the initial load is suspended from the center of the main lever bearing, and from that point is transmitted through the true center line of the lever to each succeeding bearing. The tip of one main lever of each pair is directly over or below the true center line of the opposite lever so that the combined pull of both levers is in one straight line to the center of the bearing, which is on the center line of the longitudinal lever. The same is true at the connection of the longitudinal levers to the transverse or fifth lever. It is explained that the load on each knife edge is so applied and the levers are so designed that there is neither torsional strain in the levers nor any tendency to displace the levers from their bearings, nor to produce unequal wear upon different parts of the same bearing.

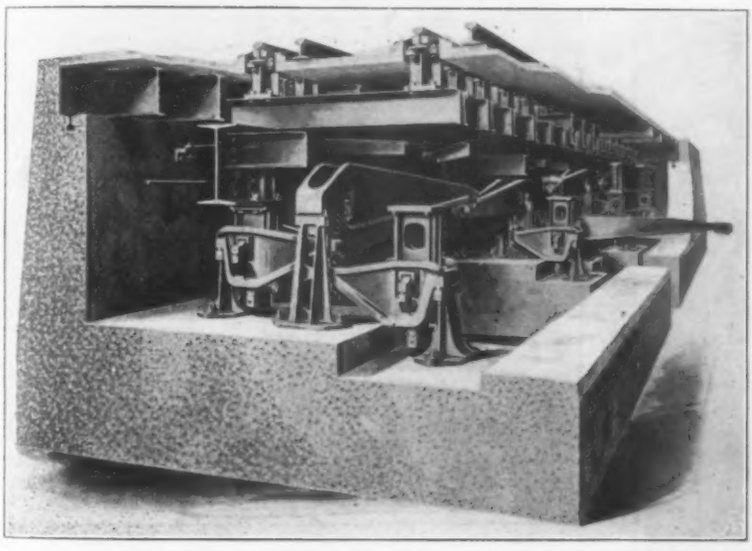
The scale is built in four sections, with a series of primary or main levers transmitting the load to longitudinal extension levers which in turn transmit the load to a transverse extension lever which connects through a shelf lever to the beam.

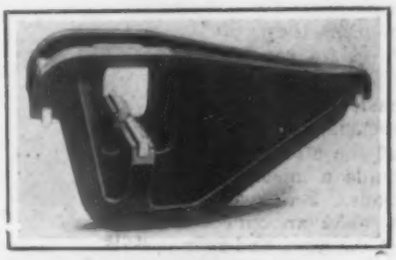
It is built in two capacities for light duty service, or such service where only a relatively small number of cars are to be weighed. These two capacities are 60-tons and 75-tons per section and in lengths of 50 ft., 56 ft. and 60 ft. effective weighing rail. For heavy service or where a large number of cars are to be weighed the scale will be built in capacities of 75-tons and 100-tons per section, and in the same three lengths as above. The difference between the light duty and heavy duty scales is mainly in the loading per linear inch of knife edges, this being 5000 lb. in the heavy duty scales and 6000 lb. in the light duty scales. This difference in allowable loading and the allowance of a higher multiple main lever in the light duty scales serves to make somewhat lighter castings than are necessary in the heavy duty scales. The design, it is stated, allows universal motion of the scale platform in a horizontal plane without displacing the knife edges on their bearings.

The beam is of cast iron with cross section of inverted U shape, thus to give maximum rigidity, and furnish a housing over the balance ball and track for carrying the poise. The notches are cut in a steel bar inserted in the bottom of the back web, which insures that no dirt can fall and lodge in them. The type for printing weights on tickets is fastened on the bottom of the front web.

The center indicating poise is suspended from three







Track Scale Built in Capacities for Light Duty Service of 60 Tons or 75 Tons Per Section, and for Heavy-Duty Service In Capacities of 75 Tons and 100 Tons Per Section. The double-web section is used throughout all levers of the scale in place of the customary I section levers. The beam has a cross-section of inverted U-shape which houses the balance ball and tracks for carrying the poise

ball bearing trolley wheels and runs upon a machined track housed inside the beam. Its exact weighing position is determined by a positive locking device of 30 or more teeth engaging the same number of notches of the beam. A handle on the front of the poise serves to operate the pawl when it is turned in one direction and to print the tickets when turned in the other direction.

The design is such, it is explained, that loading for knife edges will not exceed 5000 lb. per linear inch on heavy duty scales and 6000 lb. on light duty scales. The tensile strength of the special bolt steel used is not less than 120,000 lb. per sq. in.

Wide pits afford ample room for installing the scale correctly as well as for convenient examination from time to time. It is emphasized that the design of weighbridge, the mounting of dead rail supports and fastening, the arrangement of weather guards, and all other details have been worked out carefully, with a view to obtaining the most economical way, consistent with accurate performance and at the same time, the lowest maintenance cost.

Automatic Control of High Temperatures

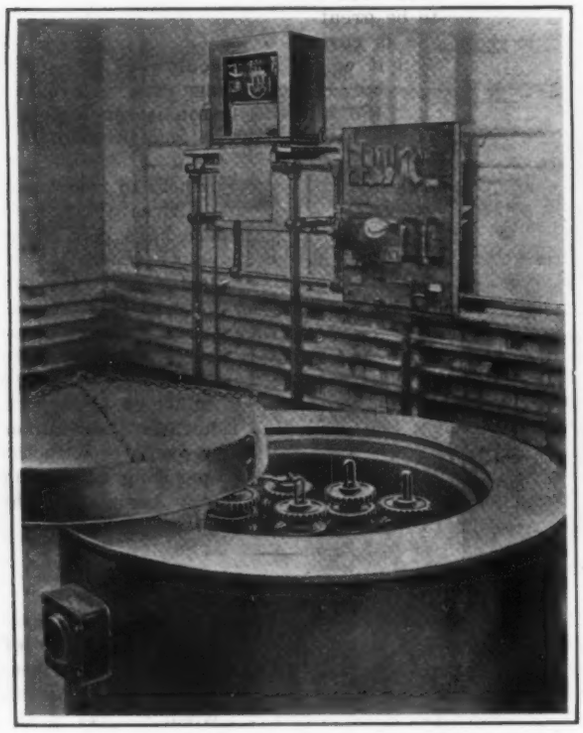
Recording Potentiometer Acts as a Controller— Functions of Single and Double Point Instruments

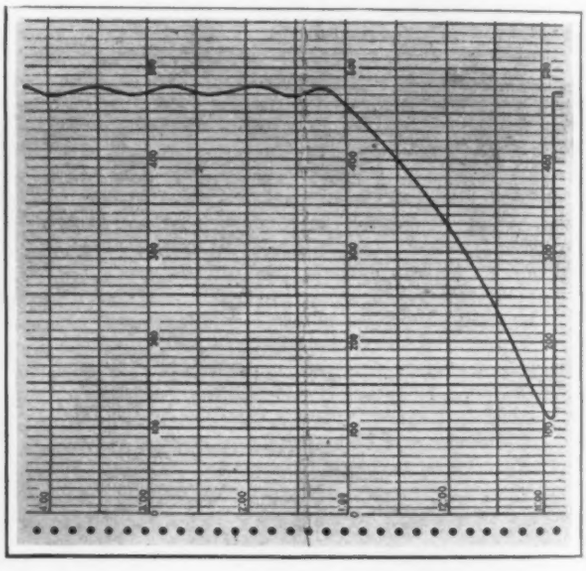
THE automatic recording controller manufactured by the Leeds & Northrup Co., Philadelphia, utilizes the devices and methods developed in perfecting the potentiometer system of pyrometry. Only slight changes and additions were required to enable the recording potentiometer to act as the initially governing member of a system of control, while still performing, without any diminution of accuracy, all of its functions as a recording pyrometer. By keeping an autographic record of temperature it shows the results in the kiln or furnace of its own regulative action.

A typical chart from the recording controller is shown. The chart is 10 inches wide and the scale is very nearly uniform. The record is a continuous line made in ink by a pen having sufficient capacity to carry from three to six days' supply. The time elapsing between the occurrence of a change in the electromotive force of the couple and the appearance of a corresponding change on the record is about two seconds. The pen, if the changing electromotive force requires it, will move at a rate which will carry it across the entire scale in 50 seconds. The accuracy is ½ per cent of the range of the particular instrument. Thus a recorder having a range of 0 deg. to 1000 deg. C. will be adjusted to an accuracy of 5 deg. C. The sensitivity is ¼ per cent, or, in the above case, 2½ deg. C. It should be noted that ¼ per cent is equivalent to 1/25 in. on the paper.

Considered as a controller this type of machine is essentially a device through which minute forces generated by a thermocouple are enabled to direct forces vastly greater. This result is obtained in three stages:

1.—When the temperature is correct the pointer of the galvanometer in the measuring circuit stands at its neutral or no-current position. If the temperature departs from that which is desired, the galvanometer will take up a new position, but no other work is required of the galvanometer save that it shall depart from zero, that is, it is not required to make or complete a contact. In this new position it serves so to set the mechanism as to readjust the potentiometer circuit to correspond with the new temperature value. In so doing the recording pen is also moved to register the new temperature and, also, a circuit is closed which operates a relay. The power which readjusts the potentiometer circuit, which moves the pen on the scale and which closes the relay circuit is supplied by a continuously running constant-speed motor.





Recording Controller in Connection with Drawing Furnace, Treating Automobile Gears Which Have Been Hardened by the Hump Method. A portion of a chart produced by the controller is shown above

2.—The relay circuit that is closed or opened as above described is of such nature that a standard commercial relay, such as is used about power houses and in power circuits, may be employed. These relays should properly be so chosen as to harmonize with the valves, rheostats, switches, etc., with which they are to operate.

3.—The mechanism at furnace, oven, vat, kiln, etc., is an integral part, usually of the device whose temperature is to be controlled, and upon its design, proportioning and adjustment, depends the excellence of the results obtained. Each installation has to be considered individually. The presence of the continuous record enables the engineer to see exactly the effect of changes in the adjustments of valves, etc., and makes it easy, comparatively speaking, to readjust the valve or cut-off arrangement to secure the best results.

A single-point recording controller utilizes the e.m.f. of one thermocouple to record the temperature

at the point at which the couple is located, as, for example, in an electric drawing or tempering furnace. With suitable accessory devices, the nature of which will depend upon the type of equipmnt to be controlled, it automatically holds the temperature at the thermocouple constant at the value for which the contacts are set. This setting can readily be changed by the operator to any desired value within the range of the instrument.

The recording controller can, if desired, be arranged to operate a five-signal light system, as follows: A white light when the temperature is right, a red and white light when the temperature is slightly high, and a white and a green light when the temperature is slightly low. When the temperature varies still further, the red or the green light, alone, as the case may be, is lit. With this device, should anything go wrong with the control mechanism, the fact will be signalled to the furnace man immediately by the lights, which can be located wherever desired.

A double recording controller is one arranged to operate alternately from two thermocouples and to control through two respective sets of relays. It may serve either to control the temperature of two separate ovens, furnaces, etc., at the same temperature or at different temperatures; or to control two points in a large oven or furnace at the same temperature, or at different temperatures; or it may serve to hold the furnace at first one and then another temperature in sequence. It is provided with a commutator which connects first one thermocouple and relay and then the other to the instrument circuits, each set once a minute, or less frequently, as the circumstances may require. Depending upon the manner in which it is connected into the furnace or oven system, it will thus serve to hold two units at one constant temperature or at different temperatures, or it will serve to hold one point at a given temperature until the second point has reached a predetermined temperature and then throw over and hold the first point at some other temperature, usually lower than during the heating period. In this latter service the machine is used as a one-point two-temperature controller. It is in such service that it found its first and very extensive use in the heat treatment of large gun forgings during the war. One couple has its hot end in immediate contact with, or buried in, the work in the furnace. The other is located in the atmosphere of the furnace, preferably near the heat source. The control discs are so set that as long as the contact or work couple is below a predetermined temperature the air couple tends to hold the furnace at a high temperature or to force heat into the charge, but after the work couple has reached the desired temperature, the controller automatically throws over and tends to hold the air couple at a lower temperature, which is usually set at a value just sufficient to supply the radiation losses, thus holding the charge constant.

Thus, in gun treatment work, the contact couple was in immediate contact with the gun in an electric resistance furnace and the air couple was located near the resistor winding. The controller was set to hold a comparatively high temperature, say 1800 deg. Fahr., and this temperature was maintained until the contact couple showed that the surface of the work had reached, say 1450 deg. Fahr., when the control shifted and the temperature of the air couple was gradually and automatically reduced to a temperature just above the finishing temperature of the work, until the work was thoroughly "soaked out."

When the control first throws over to the lower temperature, the interior of the charge will absorb heat from the surface sufficient to cause a rapid fall in temperature below 1450 deg. Fahr., when the relays will operate in reverse order and the original connections will be restored, which will again raise the temperature to 1450 deg. Fahr., and again throw over the control. This cycle of operations will continue until the interior ceases to absorb heat from the surface, or, in other words, until the charge is heated through, and thereafter the control will remain "thrown over" to the low temperature setting, which is only slightly above the finishing temperature and just enough to supply the radiation losses of the furnace. Thus the charge is heated at the maximum rate without becoming overheated. This method applies particularly to fairly large work, since in this class of work it secures a maximum speed of heating without danger of overheating.

SUPERIOR MINE LEASES

Figuring on a Royalty Basis Gains Favor—Sales of Manganiferous Grades

The idea of leases of Lake Superior iron ore mines on a royalty figured on a percentage basis is gaining favor, and many mines are now worked in that manner. The largest percentage to owners of which the public knows is Zenith, on the Vermilion, leased so that the operators pay as royalty 20 per cent of the price of the ore at Lake Erie ports. A western Mesabi washing proposition is now being leased on a 15 per cent basis, and there are others at this same rate.

Some interest is manifest in exploration on the Vermilion, the first for a long time; several parties are preparing to open favorable looking prospects there. The Vermilion, for some reason or other, seems an alluring field for exploration, even though it is one of the most costly districts in which to prospect. Of the 300 square miles of Vermilion iron-bearing formation comprised within the well-recognized limits of the district, only about three miles have developed into mines, or about 1 per cent of the area. This is not encouraging, but, on the other hand, there are scores of places whose surface indications are almost as seductive as where mines have been found, and the profit from a mine is likely to be great.

Coal shortage is curtailing mining and shipments tremendously, and it will be a difficult matter for the mines and roads to handle the tonnage originally scheduled to be moved. So far, the season is seriously behind, and May is a month in which good work should be done.

There seems to be some little business in manganiferous ores of the Cuyuna district. Prices of 17c. per unit of combined iron and manganese have been made and a considerable sale is pending on the basis of 41c. per unit, manganese alone. This latter is for an ore assaying about 45 per cent iron natural, say 10 per cent silica, and about 13 per cent manganese. In the pending sale it is expected to raise the manganese to about 15 per cent, which makes the ore worth $6.15 at the mine, a fair price and one in which there is a profit to the operator. A large tidewater steel maker is about to examine a manganiferous property with the view of taking it over on some operating basis and stripping for a large production on a basis of profit sharing with the owners.

Decrease of Accidents

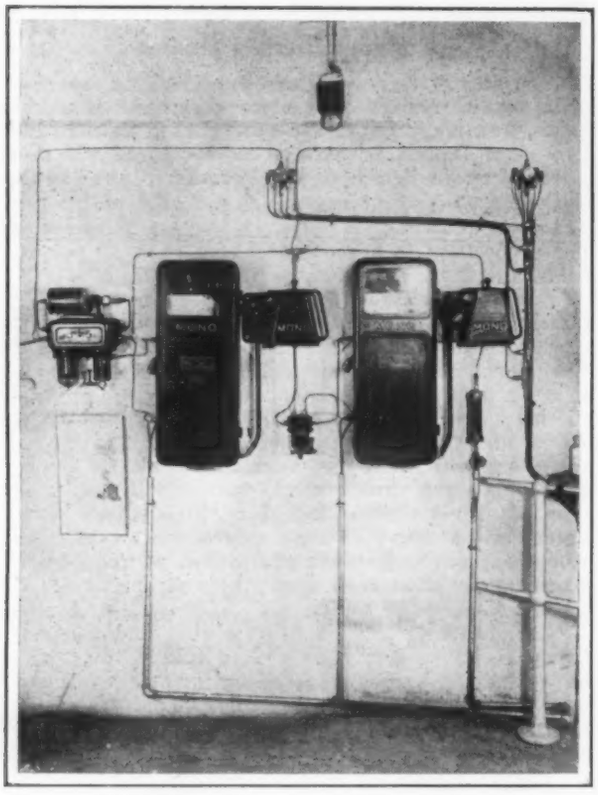
HARRISBURG, PA., May 24.—Results of education along safety lines is seen in the decreased number of accidents reported from Pennsylvania's industrial establishments, including iron and steel manufacturing plants. During the year of 1919, when 152,544 workers were injured according to the reports received by Commissioner of Labor and Industry Clifford B. Connelley, a decrease of 32,300 from the previous year was shown. In 1916 there were 255,616 accidents reported; in 1917, 227,880, and in 1918, 184,844. A steady decrease is noted in each year.

Along with the decrease in the number of accidents is a corresponding decrease in the number of fatalities. There were 2569 deaths from accidents in mills and factories, while the number reported in the previous year was 3403.

Allegheny county, the center of Pennsylvania's iron and steel industry, stood first in the number of accidents, 25,779 persons engaged in various industries being hurt. Of this number, 364 died. Philadelphia was second with 20,222 accidents and 255 deaths, while Luzerne was third with 10,143 accidents and 314 deaths. The number of deaths was less than at any time since 1915.

Combustion Recorder for CO_2 and CO

A recorder that enables the fireman to see constantly that no carbon monoxide, CO, is present in the products of combustion and that CO_2 is always maintained at a maximum, is announced by the Mono Corporation of America, 48 Coal and Iron Exchange, Buffalo, N. Y. The accompanying illustration shows the



Instruments Installed in Boiler Room for Simultaneously Recording on Charts the CO_2 and CO in the Products of Combustion

instruments which permit a simultaneous recording on charts of the CO_2 and CO.

It is pointed out that an analysis of CO_2 alone is insufficient in gaging combustion, as a correct percentage of CO_2 varies with the kind of fuel used, the method of firing, the method of admitting air, etc. Since both gases can be recorded simultaneously, it is explained that the boiler room force finds it impossible to show an extremely high CO_2 without showing some CO. The fuel must be so burned that the percentage of CO_2 is as high as possible and at the same time there must be no CO. By so doing most economical combustion is effected.

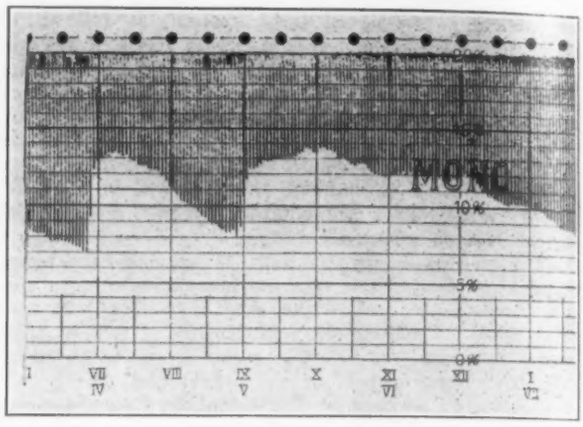
The manufacturers of the instrument have devised a premium wage payment system which involves the use of a rule which is laid over the chart. A record is kept on a sheet provided for the purpose and at the end of the month the figures are added, the average determined, and the bonus is paid.

Changes in the Cost of Living

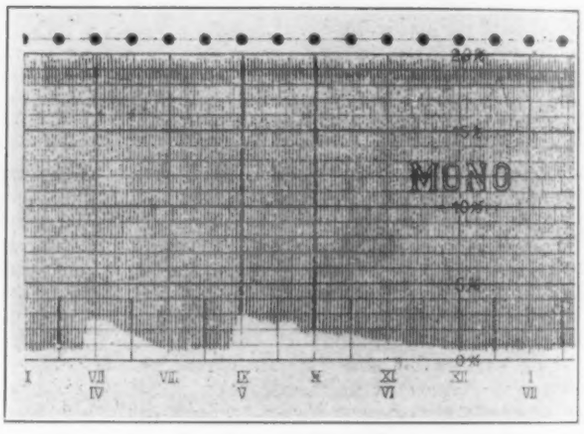
The average cost of living for American wage-earners rose 7 per cent between November, 1919, and March, 1920, according to a preliminary announcement made by the National Industrial Conference Board. This marks a total increase of about 95 per cent since July, 1914, and an increase of 21 per cent within the last 12 months. These figures are the result of the board's sixth survey of changes in the cost of living in the United States, a complete report of which will be available within a few weeks.

As in earlier reports on the cost of living made by the board, the information which forms the basis of the above estimates was obtained from a large number of retail dealers in clothing and fuel, and from agents and others in close touch with the real estate situation. The retail food price index numbers of the United States Bureau of Labor Statistics were used as indicative of changes in the cost of that item.

The board's third study of the cost of living in specific localities has just been completed. In this an attempt is made to approximate the actual cost of living among the silk mill operatives in three towns in the



The CO_2 Chart, Above, Was Taken Simultaneously With the CO Chart, Below



northern part of Hudson County, N. J., in January, 1920, and to estimate the change in the cost of living in these towns between January, 1914, and January, 1920.

From this study it appears that on the basis of average prices in January, 1920, $1,604.15 annually would be required to maintain a man, wife, and three children under 14 years of age at a fair minimum standard of living in West Hoboken and Union Hill, N. J. This total was made up as follows: Food, $728; shelter, $216; clothing, $308.50; fuel, heat and light, $65.65; sundries, $286. In West New York rents averaged $228 annually, which brought the total annual cost of living there to $1,616.15. These totals represent increases of 87 per cent and 88 per cent respectively since 1914.

Complete details of this investigation will be printed in the report which will be published in a few weeks.

A fuel feeder known as the Sparton, which employs a new principle in furnishing gasoline to the motor car's engine, that of pumping the fluid by the engine's compression, is announced by the Sparks-Withington Co., Jackson, Mich. The fuel supply, it is explained, is not only positive but varies directly with the engine load.

To finance extensive additions to its plant at Warren, Ohio, the Warren Iron & Steel Co. has increased its capital stock from $200,000 to $2,250,000. The plant now has one train of rolls of three stands and four additional mills are being added. The company produces high carbon steel sheets for agricultural implements.

Prospects for American Products in Europe

National Machine Tool Builders' Association Considers Outlook for Foreign Trade—President Newton Says If There Is Depression in This Country It Will Not Last Long

DESPITE present uncertainties in the business world, President A. E. Newton told members of the National Machine Tool Builders' Association at the spring meeting in Atlantic City last week that he could see no reason for apprehension. "If we are to have a business depression," he said, "it will be of short duration. To-day most of us are experiencing a shortage of new orders, although having plenty of unfilled orders on our books. I am looking forward to the resumption of good business conditions in a few months."

Carl Dietz, vice-president of the Norton Co., Worcester, Mass., made a most interesting address on conditions in Europe, declaring that he could see no dark clouds on our foreign market horizon that are not lined, and heavily lined, with silver. He stated that it would be years before the German machine-tool manufacturer can again become an important factor in world trade.

The needs of the railroads were told of by Roy V. Wright, managing editor of the *Railway Age*, who said that to provide for the normal growth of the railroads and to bring the present equipment into proper shape, at least $54,000,000 should be expended for shop equipment within the next three years.

The meeting opened at the Hotel Traymore, Thursday morning, May 20, and continued until Friday afternoon. One of the important actions was a decision to go ahead with the publication of an export catalog of machine tools.

President Newton, in his opening address, said:

"At our last convention, we were rather surprised that business conditions had held so favorably since the signing of the armistice. We had been promised and most of us had looked forward to a real depression, at least in our own line of industry. We thought so many machine tools had been produced during the war period, and that so many were to be released by our Government, that it was reasonable to believe that we should have to meet an over-supplied market. Fortunately for us, things have turned out quite differently. Instead of a depression, we haxe experienced a most unusual and easy selling market, and have had a very prosperous half-year."

He stated that Government-owned machine tools have not unduly flooded the market, except that educational institutions have been supplied from that source, but his belief was that the absorption of these tools by the schools was bound to benefit the country materially by training more and better mechanics.

"The need for mechanical training is greater to-day than ever before," he added, "and it will be still greater in coming years. I believe that we are just starting a new period of trade and technical school development, and that the importance and necessity of these institutions is becoming more and more apparent, because of our actual dependence upon machinery and mechanical devices for the maintenance of our present, and any future betterment, of our living conditions."

Then, commenting on the present lull in demand, he made the statement, above quoted, that he looked for a resumption of good business within a few months.

"The price-cutting wave now attracting attention throughout the country," he said, "is caused by the calling of loans, or the refusal of loans, rather than the over-supply of materials; and in most cases these same materials which are being disposed of by the retailers could not be replaced at prices as low as they are now being sold.

"In the machine-tool industry, I know that we could not in the near future replace our inventories of finished and semi-finished materials at anywhere near the cost of our present inventories. I also know that during the past several months our costs of production have increased much faster than our selling prices. Therefore, the prices of machine tools will remain at least as high as the present level."

The remainder of his address dealt with the necessity for uniform and accurate cost-finding methods.

European Conditions and American Trade

In his address on "European Conditions as Affecting the American Machine-Tool Trade," Carl Dietz, vice-president of the Norton Co., who has spent considerable time abroad, spoke in part as follows:

"There are about as many opinions on industrial conditions in Europe as individuals expressing themselves thereon; even among those who had an opportunity to personally study the ground, complete unity of thought is not found. It depends so very largely upon the manner of penetration, the industries visited, individuals interviewed and then on the proper analysis of this multiplicity of data.

"As everywhere else in the world, the demand for every commodity is beyond the ability of industries to furnish. Unlike ourselves, Europe is now mostly dependent upon imports—those imports coming largely from us.

"The war left her pretty well paralyzed industrially and only gradually will the situation right itself. Such wholesale disarrangement of industry, even omitting destruction, complete financial exhaustion and credit strain, to say nothing of morale collapse, cannot be overcome in one or two years.

"Europe for the moment, with the possible exception of England, requires credit and requires it in very large doses. She cannot continue indefinitely to purchase more heavily than she sells, still further straining credit and depressing her currency values, without inevitably going bankrupt.

"The result is that purchases from countries whose currencies are at a premium will be held down to bare necessities and the buying power directed toward the markets where advantages may be had; friend or late enemy, economic necessity will control, quite stripped of sentiment.

Where the Machine Tools Went

"During the war relatively huge quantities of machine tools were shipped to England and France, some to Italy, many of which served gallantly in the produc-

tion of needed war materials, but many also never saw service and with the others have since been either put to useful service in France and Belgium or cataloged and are being held for the reconstruction and needs of the destroyed industries in the war area.

"When the Germans ransacked Belgium and France, they did it thoroughly, not by any hit or miss method, but with a system that can leave no doubt as to their complete knowledge of the existence of every tool and its best possible service to them. Everything was ultimately either transported to Germany, or demolished, if of no direct military value. Now many of these tools are being returned—allied commissions spotting them throughout Germany and returning them from whence they came.

"We found one of our own grinders, one of the very early ones, machine No. 17, built in 1902, which was operated at the Bolinck plant in Brussels until June, 1917, but after August, 1914, by the invaders. It was then taken to Germany, set up and operated at a plant near Bonn, but now again through the activities of the allied commissions has been returned to its original foundations and is merrily doing the same work as before the war.

"This is true of many Belgian and French tools. In many cases, they require considerable repairs as in the case of this Bolinck machine. The tremendously high prices at present considered, it is economy to use as much of this material as can be salvaged until economic strength for replacement of antiquated equipment is gradually developed.

Will Challenge American Product

"The impetus which the war has given to the machine tool industry will prompt many foreign machine tool builders to challenge the American product not only in their own countries, but in foreign markets, even to a greater extent than ever before in our own domestic market.

"English makers will not be content to let American products have the sway of pre-war days, but will try to meet the demand of her growing mass production industries, especially the automobile development. Through its machine tool association, English builders will invade systematically and in force other markets worthy of development and capable of an adequate return.

"At the moment, the rate of exchange favors British builders and even if everything else were equal, the American tools are heavily handicapped with 20 per cent monetary shrinkage to carry. Wages in Great Britain have risen sharply, so that in some cases, with the bonuses paid, the average hourly rate is not materially different from our own, but in a large number of metal working plants the average is still a shade under 50c. per hour (normal rate of exchange) for the whole shop force. On the other hand, it is freely admitted that the British worker does not produce as much as ours. In the automobile industry, a prominent manager stated that he was actually equipping several large plants with 50 per cent larger machine tool capacity for comparable production than he did in America.

"There is in England at this time a very active demand for machine tools and British manufacturers are indeed hard pressed to meet it. The long drawn out molders' strike of last winter, in which 50,000 strikers for more than 20 weeks affected upwards of 300,000 shop workers, is in a measure responsible for the accumulated demand. This fact in spite of the handicap has prompted the placing of orders of no small consequence in the American market and we still have the advantage of some special types of machines which, until the foreign builders have further developed their activity, will continue to come from here.

Needs of France and Belgium

"France and Belgium, with the gradual rebuilding of their industries, will continue to require machine tools, but a great deal must precede the placing of this equipment. They must first reconstruct their plants and then be sure of their raw material, coal for power, iron and steel to be worked with, also a more stable labor condition. Unless machine tools are not acquired for the immediate production of wealth creating objects, it would be folly for Belgium and France to place orders with us at the present high prices and with the dollar at the premium it commands. For example, a tool that in 1914 cost $2000, equivalent roughly to 10,000 francs, to-day costs in America not less than $4000, and at the present exchange rate 60,000 francs. So far as the French or Belgian buyer is concerned, to him the price has advanced six fold. He naturally hesitates and seeks either to get along without new American equipment or turns his attention to other markets that may serve his purpose to better financial advantage.

"Italy is in the same relative position and any of these countries can, provided delivery may be secured, buy to better advantage in England so long as the dollar pound sterling exchange shows 25 per cent depreciation.

Popular Delusions in Regard to Germany

"Much has been said of the effect of German machine tools on the markets outside of Germany. There appears to be a popular delusion that Germany is going to promptly step in and bid for the machine tool demand of the world at what would be to us ruinous prices. Nothing can be farther from the truth. To be sure, not long after the armistice when the German marks went tobogganing, wonderful bargains resulted in buying such German tools as were available. So far as we were able to learn, these were very promptly snapped up, largely by the neutrals, and to some extent by France, Belgium and Italy.

"For a considerable period last year, the average monthly outgo for export of German machine tools amounted to about 50,000,000 marks. This sounds very large, but when it is considered that the prices at which such tools were sold range from 12 to 17 times pre-war prices, it could after all not have been a very large tonnage. The German makers are crowded with orders, many of which they took at fixed prices and then found themselves in the dilemma of not being able to get raw material, or if they got it, at a price that would not admit of the transaction being carried through without a heavy loss to which was further added the extremely uncertain and constantly upward tendency of labor.

"Contrary to all that has been said of the Germans going back with renewed energy, a willingness to work for the sake of retrieving their economic losses, we did not learn of a single instance where such a spirit was even remotely indicated. On the contrary, demands of the workers have gone to almost preposterous lengths, not so much from the standpoint of wage increase, which considering the increased cost of living, are at least justified, but because of their attitude toward production as a whole. According to our conception of the word production, the broad statement can be made that they are not producing and adhere to the legal eight-hour day of slothful activity with a rigidity that can be called hardly anything else but stubbornness. Of course, in many cases raw materials are lacking, but even when these are available, instead of taking advantage of the opportunity to again make of themselves a producing nation along economic lines, they now prefer to spend their time in going on strike for petty reasons, and scheming out new ways for bringing about socialization of industry that in the end can spell nothing else but ruin, if not checked soon. Freedom in shop management according to any sane conception of industry's needs, is almost wholly denied and the principal control of shop policies rests almost entirely in the shop council. According to the wording of this law, it is supposed to operate for the benefit of employer and employee alike, but in practice it has resolved itself into nothing else but a bargaining committee usually

antagonistic to everything excepting that which procures for the worker a larger measure of return without regard for what he gives in exchange.

Forced Recognition of the Union

"Now a further step has been undertaken which is virtually a forced recognition of the union. If one quarter of the shop council, which by the way is chosen entirely without prejudice from any other source, by the workers themselves, elect to have a union delegate take part in any of its deliberation with the management, the latter has no choice but to recognize such delegate as a factor in his shop relations and, of course, the delegate dominates the situation. The only doubtful ameliorating provision is that the employer has the right to call in a member of the employer's association of the particular district in which he happens to be operating, presumably for moral support.

"To be sure, living costs, generally due to the breaking down of transportation systems, shortage of fuel and food products and clothing, have been driven upward to about 15 times the pre-war basis and the worker's wage increases are probably about 10 times pre-war rates. In order to make up the difference, the workers have from time to time in practically every industry demanded what can be termed nothing else but a 'hand out' of so many hundreds or thousands of marks per person to cover the extraordinary living cost. In some cases wages are more or less regularly made retroactive, usually back to the time of the last wage increase agreement.

"With such economic conditions and so distorted a national sense of economic needs, one cannot conceive of a German machine tool manufacturer becoming much of a factor in the world's markets in the immediate future.

"Financiers have recognized the altogether intolerable condition resulting from the currency depreciation and the far reaching demoralizing effects of exports to foreign countries on the mark basis. Some restrictions have already been imposed and many are under serious consideration. Even now most German machine tool manufacturers are quoting on the basis of the currency of the country into which the products are to go and at a price in some cases slightly lower than that at which the same commodity can be purchased there irrespective of the market values at which these goods are sold in Germany itself. This is not unreasonable since an income must be secured from all available sources.

"Those who have placed orders for commodities in Germany are finding themselves either unable to get the product at any price or only at the prices for which the German manufacturer is willing to let the product go, when it is finally ready to ship.

"No one could blame Belgium, France and Italy for buying products in Germany, in view of the advantage that can be taken of the exchange rate between their respective currencies and the mark. They are still financially better off than when purchases of similar commodities are made in England or the United States.

"Belgium has a huge quantity, over seven billion German marks left at the time of the armistice and assumed by that country for release of financial obligations to the Allies. The only market open to relieve her of this financial white elephant is Germany. France and Italy have the advantage of exchange rate if the Germans do not still further force their prices to prohibitive levels.

Not a Serious Menace

"Given a stable condition, a national sense of effort, raw material and transportation facilities, Germany could and would become a factor to be recognized, but with these attributes lacking, she cannot be looked upon as a serious menace for some years to come.

"During the period of complete isolation due to the War, German manufacturers have made faithful copies of some of our well known American tools and are marketing them without regard for origin of design. They will in due course try to invade other markets with these products, but after all we have not stood still and have gone far beyond the status of the machine tool trade of five or six years ago. The newer developments making users less dependent on either the skill or personal interest of the worker cannot fail to command attention and respect that will result in a continuance and even further extension of our machine tool industry, in foreign parts, even though for the moment foreign demand is at low ebb.

"It is not only understandable but perhaps even gratifying that this demand is low. We all have more than we can do to take care of the home requirement and it is very much to be doubted that any of our prestige or respect for our tools is materially suffering in Europe because of this.

The Levelling Process

"There is a levelling process going on. Never again will we see the disparity between wages here and abroad. The world has grown smaller, as it were, and in the various manufacturing countries in due course the same general fundamental conditions will prevail. Prices will not be nearly so important a factor in the future trade relations. While this process of economic adjustment is going on and Europe begins to manufacture after her plants are re-established and raw materials are available, why not take advantage of the instrument happily made available through the Edge law? The means thus given us should be taken advantage of in the broadest possible way as a counter to similar foreign trade expansion by others, notably England. Beyond this have we not the ingenuity to continue the development of machine tools more than sufficient to counteract whatever handicaps there may be? We were able to do fairly well when merit had to fight price—can we not do even better when we force the foreign competitor to depend more upon merit than price. I think so, in fact, am sure of it, and as a consequence can see no dark clouds on our foreign market horizon that are not lined and heavily lined with silver."

Needs of the Railroads

Talking on "The Relation of Machine Tools to the Transportation Problem," Roy V. Wright said:

"In general it is safe to say that there are very few roads that are not today in need of a considerable number of new tools, while many of the roads ought, in the interests of efficiency, to make very heavy expenditures for machine tools and shop equipment. The *Railway Age* in an article in its January 2, 1920, issue, showed as a result of an extensive and careful study that to provide for the normal growth of the railroads and to bring the equipment into proper shape at least $54,000,000 should be expended for shop machinery and tools within the next three years.

"In one large shop which is fairly well equipped with modern tools it was recently estimated on the basis of a detailed study that about 5 per cent of the tools were obsolete. This shop, however, represents very much better than average conditions.

"It may be argued that the roads cannot afford to buy new tools to replace the older ones. This is not true in many cases, for the roads are wasting more money by keeping the old tools in service than if they were to 'take the bull by the horns' and get rid of them. There are any number of tools in the railroad shops of this country that are more than fifty years old, and many that were installed in the 'sixties.' How any mechanical department can justify the continued use of these tools is a question which it is difficult to answer.

"It is important when a road is contemplating the purchase of locomotives that it consider at the same time the additional facilities which will be required to care for the new power. The shortsightedness of overlooking this was clearly shown three years ago when the roads under great stress awakened suddenly to the fact they had steadily been adding to the number and size of their locomotives for years without making a corresponding increase in the facilities for taking care of them. Not a few roads are to-day years behind in their machine tool and shop equipment. This must be made up.

"Many special tools are needed in the shop to-day to provide for the larger car and locomotive parts which have been introduced in recent years."

OFFICE FORCE REDUCED

President Campbell, of Youngstown Steel & Tube Co., Explains Reason for the Action

Prefacing a similar curtailment by other manufacturers in the Youngstown district, the Youngstown Sheet & Tube Co. has reduced its office force to conform to operation of the company's properties at 75 per cent of normal for a protracted period. About 20 per cent of the clerks are affected by the reduction. Limited transportation facilities will prevent the steel industry in the Mahoning Valley from operating more than 75 per cent of normal, Mr. Campbell believes, for a long time ahead. "We are facing five years at least of the biggest business the country has ever seen," he states. "But now, with the railroad strike crippling transportation, with lack of rolling stock and adequate terminals, we cannot expect to have sufficient carrying capacity for quite a long time."

Granting of increased rates for the railroads enabling them to buy new cars and locomotives and add to their facilities is the only solution of the problem, Mr. Campbell declares.

"We are simply laying off part of our office force to conform to the conditions which seem to confront us for the immediate future," he explains. "For more than a year we have been carrying our full force when conditions did not warrant it. Last spring the plants were not operating to a great extent until June, when conditions began to improve. They continued good in July and August, when we were operating at 100 per cent. We went good until Sept. 22, when the steel strike started. After that was the coal shortage, followed in March and up to the present time by the railroad strike, which allowed us less than ever.

"At the present time we are operating between 40 and 50 per cent and at the same time we have been carrying our full force in the offices and other departments. This has been going on for more than a year and we could stand it no longer. Our overhead expenses are so high that we are making no money. We hated to do this, but there is apparently no other way out of it.

"For the immediate future, it looks as though the transportation facilities of the Valley would not handle any more than 75 per cent of our output. There will be no change until the railroads are able to secure the money to build up their lines, adding new cars and engines. This will not be until the rates are put up.

"The roads are guaranteed an income by the Government, but this ends in September. After that the railroads must take care of themselves. It will take at least that long for an increase in rates to go into effect. But after they go into effect it will take sometime to negotiate loans and have new equipment built. This will be at least the first of the year.

"I am not pessimistic over the situation, but the conditions must be faced as they are. The demands of the future are great and it will take at least five years to catch up with the demand. We have been through three years of manufacturing materials to be destroyed. Now we will manufacture materials for building up. The railroads will at once begin buying cars and engines and rails when money is forthcoming to permit it.

"Just at the present time with large orders on our books, we cannot turn our steel at a profit on account of lack of fuel which prevents us from operating to capacity. With pig iron at $45 a ton and steel high in proportion, the cost of construction is prohibitive. With return to normal conditions and with operations at normal the cost will come down."

SHORTAGE IN CANADA

Many More Cars Needed—Strong Demand for Plates and Tubes

TORONTO, May 24.—The failure of the transportation companies in the United States to keep up a steady supply of coal is bringing about a serious situation in the steel-making industry of some parts of Canada. Robert Hobson, of the Steel Co. of Canada, made the statement that it is getting about 300 tons a day, whereas it needs 2000 tons per day to keep its coking plant in operation. The company banked its blast furnaces and the finishing departments are running irregularly on such material as can be secured. There is a very large volume of business on the books of the company now, and much of it is badly needed by the Canadian trade for vital operations in various departments.

Premium sales figure largely in the available supply that can be secured in this district. One Toronto buyer went to one of the independent mills this week for a limited tonnage of plate. He paid a price of 4.75c. base, to which was added a 10 per cent extra for size. Add freight, duty, war tax, exchange and yardage costs, and the consumer in Canada will be paying 8.25c. per lb. for 3/16-in. plate.

Tubes are much wanted, but shipments of these are apparently lost in the tangle between the mills and this point. One customer wrote and wired several times, finally getting the answer that his order was probably in a pile of some 50,000 tons that was stacked in the yards awaiting the time when it would be possible to ship.

Using the Canadian Plate

Halifax Shipyards, Ltd., working on large Government contracts, have put in their first trainload of ship plate turned out at the plant of the Dominion Steel Corporation at Sydney, which mill will be taken into the British Empire Steel Corporation. Officials of Shipyards, Ltd., are well pleased at the way the plate works, claiming that it shears well and stands up to Lloyds requirements regarding tensile strength, etc.

British firms having representatives in this country report that they are getting much better service from their home offices in the matter of shipments than they have been experiencing since the war. One shipment of small tools was delivered to the purchaser within three weeks of the sending of the order.

The Canadian Railway Board, formerly the Canadian War Board, is impressing upon shippers by circular and otherwise the absolute necessity of loading cars to the limit. They claim that now the average load put in a car is only slightly over 22 tons, whereas in the time of the war cars were loaded to something better than 27 tons on an average.

High Coal and Coke Prices

UNIONTOWN, PA., May 24.—Coal market speculation during the past week resulted in quotations as high as $7.45, ovens, as compared with $2.35 under Fuel Administration control. While few sales were made at the high figure, the conservative group of operators and brokers are fearful of the results of such speculation and are bringing every effort to bear to force the market to an equitable basis. The majority of the operators and brokers refuse to touch the market at anywhere near that price, on account of the manifold risks involved. The same risks are involved in the coke market, quotations now being from $12 to $15, with but few sales at those prices, however.

During the early days of last week car placements took a decided spurt in the Connellsville coke region. During the latter half, however, placements were far less. While the situation as to cars is such as to cause optimism, there is really little real improvement so far in the railroad congestion as reflected in the Connellsville region.

Strike of river crews and resultant tie-up of river transportation, which would have been a final body blow to the region, especially the Klondike field, has been averted temporarily at least by an agreement between the companies and the river crafts.

Railroads Must Have Help of Business Men

F. M. Fuller of American Sheet & Tin Plate Co. Urges That Assistance Be Given Carriers—Meeting of Metal Branch of National Hardware Association

THE ninth annual meeting of the Metal Branch of the National Hardware Association was held at Hotel Cleveland, Cleveland, May 21-22, with a larger attendance than at any previous meeting. Previously all regular meetings of the branch were held in Pittsburgh. The sessions were attended by about 100 jobbers and manufacturers of sheet and tin plate and a great deal of interest was aroused in various discussions of timely topics. W. H. Donlevy, Carter, Donlevy & Co., Philadelphia, presided as chairman of the sessions.

Important general subjects that were brought out in the discussions included trade conditions, the present industrial situation and future outlook. It was brought out that while there may be a little easing up in other lines, there is no let-up in the demand for sheets and tin plate, and jobbers' stocks are very low. In spite of the unfavorable financial situation and tightening of credits which were commented upon, the general feeling about the future was optimistic.

W. D. Taylor, president the George Worthington Co., Cleveland, made a brief address of welcome, being called upon for the opening remarks in place of Robert H. Treeman, president the National Hardware Association, who was unable to be present. Chairman Donlevy, in a few introductory remarks, referred to present industrial conditions. He said that now was not the time for pessimism or for hysteria, but that it is the time for every business man to assist in bringing about an orderly deflation of prices.

Prospects for Rest of This Year

F. M. Fuller of the American Sheet & Tin Plate Co., Pittsburgh, presented a paper on "Production and Demand for the Remainder of 1920." He said that it was unfortunate that present chaotic conditions made it impossible to make an accurate forecast, but it now appears that mill operations will be governed entirely, within the next few months at least, by transportation facilities. Labor troubles have been breaking out in new places, and it is almost impossible for a manufacturer to forecast with any degree of certainty the extent of production on the following day, much less the next week or month. The most important factor in the entire situation is the shortage of cars. It has been months since the coal mines were operating on a normal basis, but he thought that this situation would correct itself. Shortage of labor is directly responsible, but he thought this situation would be remedied, if sufficient cars could be procured to warrant operation of the mines more than two or three days per week.

Through the efforts of various traffic departments of the United States Steel Corporation toward the heavier loading of cars the equivalent of 344,840 cars were saved from 1911 to 1919 inclusive. Speaking of present conditions in the finishing mills, Mr. Fuller said that based on knowledge of rolled material held by the subsidiary companies of the Steel Corporation, he estimated that at present fully 1,000,000 tons of finished material was piled up awaiting shipment. In tin plate there is at least 2,500,000 boxes. Even were cars available to move the entire amount, it would be possible to effect only a gradual release of this tonnage, and it is reasonable to expect that it would require months to clear up these accumulations. Continuing, Mr. Fuller said:

Production and Economy

"Increased production and a rigid economy are necessary factors in the program of readjustment, but these will avail us little or nothing unless we have transportation facilities. As a matter of fact, increased production at this time would only result in greater congestion in freight yards, terminals and gateways where cars, in many cases, have been loaded for weeks and months. It is our duty to the country to facilitate and aid in the rehabilitation of the railroads. The individual part may be small, but the aggregate is large, and the sooner each business man comes to a full realization of this fact, the better it will be for him and everybody else. Considering the question of demand, some concern is justified regarding wheat and other grains. Late reports from some lines of industry indicate a slight cessation in the demand for finished goods. It is likewise reported that collections are not up to the standard of recent months. There is also a disposition, more or less widespread, to reduce stocks by making substantial reductions in retail prices.

"Generally speaking, the peak of public buying in many lines has probably been reached and passed, but we have observed no indications of this effect in the sheet and tin plate business. The inability of the sheet and tin plate manufacturers, owing to various causes, to meet their contractual obligations, has resulted in a large volume of unfilled tonnage while the warehouses of many jobbers and consumers are almost if not entirely empty. Notwithstanding the number of disturbing elements which naturally exist in some lines, the great scarcity of steel in various forms both here and abroad will, in our opinion, provide sufficient demand for sheets and tin plate, through both the jobbers and manufacturers, to warrant an optimistic outlook for the rest of 1920."

Tin Plate Mills Affected Seriously

Mr. Fuller stated that the tin plate mills are more seriously affected by the railroad strike than other finishing mills. The American Sheet & Tin Plate Co.'s mills are now running at only about 35 per cent capacity. He referred to the serious effect the scarcity of tin plate was liable to have upon the canning industry. He stated that can manufacturers are now running on only about 25 per cent of their lines and that the number of cans stored for packing food is only 30 per cent of normal. Mills are trying to concentrate their efforts to fill orders from canners.

J. B. Roberts, Youngstown Sheet & Tube Co., Youngstown, Ohio, who spoke on the same subject, thought that little steel would be available for the remainder of the year beyond what has already been sold, but that there might be some easing up in sheets and tin plate because of new mill capacity. He doubted if the steel production would be in excess of 75 per cent of normal capacity during the remainder of the year. He found the labor situation reasonably satisfactory, but that there might be a shortage were the mills able to operate at full capacity. Similar opinions regarding the labor supply were expressed by two or three mill men who entered into the discussion.

The sheet steel conference committee, through F. O. Schoedinger, Columbus, Ohio, reported that all sheet mills had individually agreed to eliminate all direct shipments of less than 25 bundle lots, and to charge a differential of 50c. per 100 lb. on direct shipments in larger amounts.

John M. Remsen, Stark Rolling Mill, Canton, Ohio, discussed "The Proper Function of the Jobber." He stated that it was no part of the jobbers' function to act as a broker. Jobbers should be distributors of material out of their own stocks, and mills should not take orders for less than carload lots. However, he admitted that exceptions would occasionally have to be made to this rule.

One jobber asked whether mills were no longer rolling 30 gage sheets, saying that he had been unable to secure this gage. This question brought out the fact that mills are still making this gage, but some are having difficulty in getting their men to work on the lighter

gages, as their earnings are larger when running on the heavier gages.

Not a Necessary Evil

H. E. Nickerson, the Congdon & Carpenter Co., Providence, R. I., in a discussion on the subject "The Service Performed by the Jobber as Warehouses for the Mills," stated that the time had gone by when manufacturers regarded jobbers as a necessary evil, but they now regarded them as a necessary link in distribution. He included in his paper letters from several large consumers, who spoke of the great importance of the jobbers as distributors of steel and allied products.

Mr. Schoedinger, in a discussion on the subject "Should not Mills give More Consideration to Their Old Regular Established Distributors Than to Speculators?" said that in view of the happenings of the last six or eight months one would think that the jobber was no longer needed. He said he had been told that some mills had sold their output for export at higher than domestic prices, that some had sold their product to automobile companies at advanced prices, and that some companies had taken men from their organization and set them up as jobbers to get higher than mill prices. "We as jobbers cannot condone the action of some of the steel manufacturers," he said. However, he thought that the condition he referred to might correct itself if the steel mills will have to look to foreign markets to sell their surplus products, as stated by President James A. Farrell of the United States Steel Corporation, in a recent address at the National Foreign Trade Convention.

Some interesting figures on the expense of the distributor in handling warehouse business as compared to direct mill shipments were presented by M. M. Riter, Riter Brothers & Co., Philadelphia. He stated that it cost his firm 16 per cent to make direct shipments and 20 per cent to make shipments from warehouses, these including selling costs.

Clifford Pierce, Betz-Pierce Co., Cleveland, in discussing "The Necessity for a Reasonable Limitation of the Sizes and Styles of Sheets to be Carried by Jobbers," stated that his company is now limiting its stock to sheets 24, 30 and 36 inches in width and 96 and 120 inches in length. Mr. Donlevy said that it was a question whether jobbers are not going too far in meeting the whims of proprietors of sheet metal shops in carrying a wide range of sizes. Manufacturers were asked to express their views on this subject and two stated that it made no difference from a manufacturing standpoint, and another that he would welcome such a move, as it would result in better shipments and in the reduction of manufacturing costs.

John Follansbee led a discussion on the subject "Has the Multiplicity of Brands in the Terne Plate Industry Had the Effect of Retarding its Growth?" and said that he believed that some manufacturers made too many brands of terne plate and that some waste could be eliminated without injury to the trade. The chair called attention to the fact that two years ago the manufacturers had agreed on four grades of terne plate, these being with 8, 15, 25 and 40-lb. coating, but the matter was allowed to rest.

The Branch by almost a unanimous vote decided to hold its annual meeting again in Cleveland next year.

EARLY DECISION URGED

Howard Elliott Opens Arguments For Higher Freight Rates for the Railroads

WASHINGTON, May 25.—A prompt and liberal decision as to the revenue needs of the railroads was urged by Howard Elliott, chairman of the sub-committee of the general committee of the Association of Railway Executives, in opening the arguments before the Interstate Commerce Commission on the question of increased freight rates. Mr. Elliott said that such an early decision along liberal lines would have an undoubted effect upon the investment market situation. Mr. Elliott pointed out that in the next three years there are $564,210,817 of maturing obligations, not counting equipment notes or notes running one year or less, which can be financed to much better advantage if the railroads are self-sustaining. Many of these obligations, he stated, bear low rates of interest, and if necessary to refund them at a very much increased rate of interest, the burden on the transportation business will be much greater.

"The proposed increases in revenue are essential to restore the credit of the railways and especially to obtain the confidence of the everyday investor," said Mr. Elliott. "The passage of the new bill has encouraged him somewhat, but he needs greater encouragement and as prompt a decision as possible, if the spirit of the new law is to be carried out in a broad, far-seeing way, realizing that the United States is relatively an undeveloped country, needing transportation in almost unlimited quantities and also in improving quality.

"The investor wants to be assured that the theory of the new law to protect and encourage the railroad business is now being put into actual practice and that, in the interest of service to the public, the law is being interpreted in a liberal manner.

"It is more important than ever before to interest the small investor because the effect of the present income tax is to take away from the man of large means an increasing amount of his income and leaves a decreasing part of it to reinvest in industrial enterprises and this never a satisfactory industrial situation."

Demand for Stainless Steel

WASHINGTON, May 25.—Consul William J. Grace reports from Sheffield, England, that there has been an enormous sale of stainless steel for cutlery purposes since the armistice.

"The demand is increasing, and the labor and machinery in the Sheffield cutlery trade are inadequate to deal with the influx of orders," says Mr. Grace. "Many manufacturers have two years' orders on their books.

"Stainless steel is being employed very largely in the manufacture of pump rods, valve spindles, valves, and other parts which are exposed to contact with water, steam and other corrosives. The scientific-instrument trade is using it for drawing instruments and other precision tools and for surgical instruments. It is being manufactured into stair rods, saucepans, and pans of varying shapes, fenders for the hearth, and even into pokers and garden implements; and butchers' rails, spikes, skewers, saws, and other butcher-shop requirements are being made from it. Sport is also taking an interest in stainless steel and is promoting a demand for golf-club heads, spurs, etc."

Urges Action on Tungsten Bill

WASHINGTON, May 25.—An appeal for early action on the bill providing increased duty for imports of tungsten was made in the Senate this week by Senator Phipps of Colorado. The bill has been pending for many months, having been passed by the House and amended somewhat by the Senate Finance Committee. Prospects for action at this session are not bright, this being one of a number of bills, including the dye embargo measure, on which no final action is likely to be taken before the recess set for June 5.

The National Marine League, which held a "national marine week" April 12 to 17 in New York, is considering giving similar exhibitions outside of New York. It announces that it will hold in New York early in 1921 a great exposition of the maritime development and resources of the United States. The purpose of the league's activities is to "arouse the entire country to a voting and investing interest in the American merchant marine."

Not Stampeded by Price-Cutting Policy

Supply and Machinery Manufacturers and Dealers in Convention at Atlantic City Take Hopeful View—Many Important Problems Earnestly Discussed

ALL previous mill supplies convention attendance records were broken at the triple convention of the National Supply and Machinery Dealers' Association, the Southern Supply and Machinery Dealers' Association, and the American Supply and Machinery Manufacturers Association, at Atlantic City, May 17, 18 and 19, held in the Marlboro-Blenheim. The actual attendance was five hundred and fifty-one.

The daily newspapers and telegraphic messages from home organization officials, received prior to the calling of the conventions to order, told of price reductions being made throughout the country on certain kinds of merchandise. Because of such business conditions, many present at first admitted apprehension, but this doubt wore off during the initial sessions, and in succeeding ones changed to confidence. The final meetings were conspicuously enthusiastic, that of the Southern Association lasting well over the schedule.

The railroad transportation, the shortage of raw material, the labor and the credit situations were among the many topics discussed from every angle. The conviction of those who spoke was that their lines of business were not governed by conditions which apply to price cutting by dry goods houses and shoe merchants. Unless the supply of dry goods, shoes, etc., were greater than the demand, it would not be necessary to reduce selling values.

On the other hand, it became more and more evident as the conventions proceeded that available stocks of mill supplies and machinery are totally inadequate; that until this shortage is overcome, there can be no serious general price deflation; that mill supplies and machinery prices are not overinflated when based on the laws of supply and demand, and that fundamentally iron and steel and allied industries must continue to function on a profitable basis if the country is to survive.

One representative of a machine tool manufacturer went so far as to predict a further advance in prices for his product based entirely on manufacturing and raw material costs, and on the law of supply and demand.

American Supply and Machinery Manufacturers Association

President
Charles W. Beaver
The Yale & Towne Mfg. Co.,
New York

First Vice-President
Irving W. Lemaux
Indianapolis Brush & Broom Mfg. Co.,
Indianapolis

Second Vice-President
J. C. Ruf
I. B. Williams & Sons,
Dover, N. H.

National Supply and Machinery Dealers' Association

President
Crannell Morgan
The Hardware & Supply Co.,
Akron, O.

First Vice-President
J. W. Wright
Colcord-Wright Machinery & Supply Co.,
St. Louis

Second Vice-President
R. F. Blair
Pittsburgh Gage & Supply Co.,
Pittsburgh

Third Vice-President
Harold Seymour
Columbia Hardware Mfg. Co.,
Cleveland

Southern Supply and Machinery Dealers' Association

President
W. Marshall Turner
Turner Supply Co.,
Mobile, Ala.

First Vice-President
F. A. Heitmann
F. W. Heitmann Co.,
Houston, Texas

Second Vice-President
J. H. McKinnon
The Cameron & Barkley Co.,
Jacksonville, Fla.

THIS change in sentiment among those attending the conventions was due in part to the opening address of George T. Bailey, president American Association, who said that a year ago the general belief among association members was that prices were due for a decline. He reminded those who saw a gloomy picture to-day that this world of ours has moved forward for thousands of years toward a reign of righteousness, and will continue to move forward toward that goal for thousands of year to come; that although civilization has at times moved with hesitant step, somehow mankind has always managed not only to survive every disaster but to emerge much better qualified to combat destructive influences. Continuing he said:

"I therefore suggest that it is just as necessary now, as during the dark days of the great war, that we, for the salvation of all nations, dedicate our lives to establishing industrial peace, for industrial peace is the corner-stone of civilization.

"Probably the most valuable advice ever given to man is contained in these two words, 'Know thyself.' This applies to groups of men as well as individuals, and at my first monthly conference in the New York office I learned that the association knew itself. I want every member to realize this." The remainder of President Bailey's remarks was confined largely to the activities of the association, and he urged the members to use the trade information more freely.

President Nicklis Optimistic

J. D. Nicklis, president National Association, in his opening address also reminded the members of his organization that the country a year previous was laboring under the delusion that the peak of prices was reached and that business was due for a slump, and that "if you will compare the conditions then with those existing now you will be reminded that those with casual knowledge and a great many with recognized wisdom were indeed quite ignorant of what actually was in store for us."

For, as he pointed out, the country was in for a period of great business prosperity, which for the most part has continued and is in force at the present time. "Most of us can recall listing our overstock, whereas to-day we are worrying a great deal about our shortage. Even with the price of labor and material at its present height and with the end apparently not yet

(*Continued on page* 1562)

Turret Rotary Shear

A rotary shear that cuts any shaped openings without cutting in from the edge and without turning the sheet, is being introduced by the Southwark Foundry & Machine Co., Philadelphia. This operation is made possible by a turret carrying the upper cutter, which while cutting, can be changed to any degree of a circle about the lower cutter, thus to cut openings in widths equal to double the throat depth and with no limit on length. The simultaneous driving of both cutters automatically pulls the sheet through the shear. The line to be cut is accurately followed by turning the guide wheel which controls the turret. This operation can be performed from either side of the machine.

The cutting of circular and oval shapes is done in

Shear Which Cuts Any Shape Without Swinging the Sheet. This is made possible because the cutters, while working, can be changed to any degree of a circle

a continuous operation. In cutting angles the clutch is thrown out by the foot lever, the upper cutter is moved to a new position on the converging line, the power is thrown in, and the new cut is made to the first line. The cutting of zigzag lines and small radii is made possible by a sensitive clutch controlled by the foot lever. The power is engaged by a mechanism that can be stopped and started within 1/32 in. The shears are made in five sizes to handle sheets up to 1 in. in thickness.

Crank Shaping Machines

A new line of crank-shaping machines, including a 16-in. single geared and a 20-in. back geared shaping machine, both designed for general machine shop and tool room work, has been brought out by the Whipp Machine Tool Co., Sidney, Ohio. Modern practices are generally followed in the design of these machines, but some new features are provided. Attention is called to their simplicity of design and the absence of intricate feed and adjusting mechanisms.

One of the most important new features is the unusually wide cross rail guides that are provided on each machine. This wide guide on the column forms a pair of external ribs which give the column unusual stiffness and rigidity, and at the same time provide a wide guide for the cross rail itself, so that the range of work never overhangs the guides.

Another new feature on the 20-in. machine is the design of the cone pulley and a bearing for the cone shaft. The hub on the cone pulley is flush with the small end of the cone, and allows the bearing in the column itself to extend nearly to the center of the cone. It is pointed out that this makes a much stiffer bearing than where an outboard support or separate sleeve bearing is used, and one that will maintain perfect alignment under heavy belt pull.

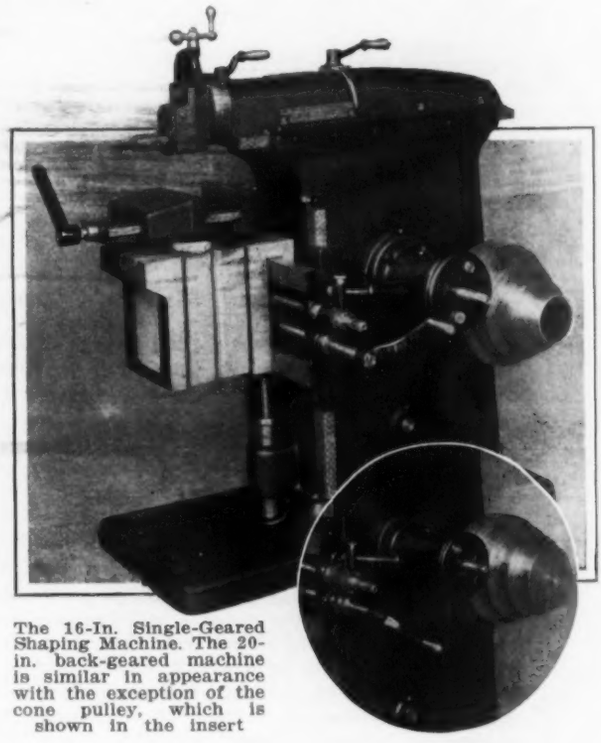
Another feature is an eccentric locking bolt for locking a swivel plate to the head. This holds the head solidly and firmly to the ram, and, it is stated, provides a quick and easy method for releasing when the head is to be swiveled. The head is graduated for accurate setting to any angle.

The column is ribbed to withstand strain when taking heavy cuts. The ram guides are extended both front and back, to give a long bearing for the ram. The nut of the telescopic elevating screw is carried in the main column casting to assure perfect alignment. The base is of the pan type to keep oil from dropping on the floor. It is ribbed underneath and extends in front to the full length of the table, forming a base for the table support. The ram is of box type, having on the 16-in. machine a bearing on the column 27 in. in length and 8½ in. in width. All specifications refer to the 16-in. machine. The length of the stroke is 16½ in. The rocker arm has long centers to provide ample power back of the cutting tool, and gives a key-seating capacity for shafts up to 2½ in.

The automatic cross feed can be adjusted for different feeds while the machine is running, and has a range of 0.018 to 0.125 in. The stroke adjustment is accomplished by an adjusting shaft through the center, and extending beyond the end of the bull gear shaft. The stroke is adjustable when the machine is running and a stroke lock is provided for use when required. A screw down is provided with a ball crank handle and a micrometer collar reading to 0.001 in.

The horizontal travel of the table is 20 in. and the vertical travel 13 in. The table is 10 in. wide, 16 in. long and 12 in. deep. The maximum distance from the table to the ram is 16½ in. The vise has tool steel jaws, and is so designed that the vise screw is in tension. The base is graduated and adjustable to any angle.

The machine is belt driven from a countershaft



The 16-In. Single-Geared Shaping Machine. The 20-in. back-geared machine is similar in appearance with the exception of the cone pulley, which is shown in the insert

and driven at 165 r.p.m. through a 4-step cone pulley, and the ratio of the gearing is 6 to 1. A table support is provided as an extra, but it is said that in most cases this is not required.

E. Arthur Tutein to Sell Goshen Iron

E. Arthur Tutein, Inc., Philadelphia, New York and Boston, will be selling agents for the output of the Goshen blast furnace at Goshen, Va., which was recently purchased from the Southeastern Iron Corporation by the Goshen Furnace Corporation. The Goshen furnace will continue to produce "Goshen" and "Victoria" brands of high-grade foundry pig iron. The monthly capacity is about 5000 tons.

Large Economical British Power Station

Economies effected by the use of large power units are exemplified in a paper "A Modern Power Station and Its Development," presented by J. S. Watson, Newcastle-On-Tyne Electric Supply Co., Ltd., England, at a recent session of the North-East Coast Institution of Engineers and Shipbuilders, Bolbec Hall, Newcastle-Upon-Tyne. The paper traces the development which has taken place in connection with the generating plans installed by the Newcastle-Upon-Tyne Electric Supply Co. This company with its associated companies was the first statutory undertaking to supply electricity on a large scale for motive purposes, to manufacturers and industrial users in the United Kingdom. The total period covered, 29 years, is divided into four stages, the fourth stage being of particular interest as it covers the construction of the Carville B station, which has a capacity of 50,000 kw. and is claimed as the most efficient station not only in Great Britain but probably in the world. The boiler houses for this plant are two in number and lie at right angles to the engine room. Each house contains two banks of three, 3-grate, water-tube boilers, each complete unit consisting of boiler, superheater and economizer, and capable of evaporating at all times 45,000 lb. of water per hr., when burning coal having a calorific value of 9000 to 11,000 B.t.u. at a pressure of 270 lb. above atmosphere and superheated to 675 deg. Fahr. from water supplied at a temperature of 90 deg. Fahr. The temperature of the outlet gases enables the economizers to raise the feed water required for the boiler to about 220 deg. Fahr., such outlet gases leaving the economizer at about 350 deg. Fahr. Mechanical draft, both forced and induced is provided to enable coal of a low grade to be burnt.

Characteristic changes which have taken place in all stages are shown in the accompanying table. These include the increase in boiler pressure, the increase in steam temperature, the higher speed of plant, the larger individual size of generating units and the more complete utilization of labor-saving appliances.

	Capacity of Station, Kw.	Average Boiler Capacity, Lb. Per Hr.	Boiler Pressure, Lb.	Steam Temperature, Deg. Fahr.	Average Capacity of Machines, Kw.	Engine or Turbine Speed, R.P.M.	Steam Consumption, Lb. Per Kw.-Hr.	Capacity Per Operator, Kw.
Pandon Dene.....	2,400	6,000	120	350	267	85	28.5	141
Neptune Bank.....	5,200	14,000	200	481	860	100 and 1,200	18.8	145
Carville "A"	43,000	28,000	200	531	5,400	1,200	14.5	409
Carville "B"	50,000	45,000	270	675	10,000	2,400	10.0	633

The Undelivered Steel from Lorraine

The item in the cable to THE IRON AGE of May 20, from its British correspondent to the effect that buyers of Lorraine steel which has not been delivered have gone to Paris to confer with the French Government in that regard makes it worth while to refer to some of the recent negotiations between the British buyers of this steel and the representatives in England of the sellers.

In a letter dated April 16 to their customers the agents outlined the situation about as follows: The three Lorraine steel works at Rombas, Knutange and Hagondange for which the steel was sold are credited with a normal capacity altogether of about 150,000 tons per month. In February, 1919, they were put under sequestration, so-called, and it was about June, 1919, that the first attempt was made to sell in Great Britain. The supply of fuel from Germany which ought to have been about 300,000 tons monthly to allow for the regular working of the three works amounted instead to 60,000 tons in June and 106,000 tons in July. The sales were made on the supposition that the Allies would compel Germany to execute the obligations of the treaty, but in September, 1919, the fuel supplied by Germany to the Lorraine steel works amounted to only 80,000 tons, and in October to 55,000 tons, and since the supply has likewise been below the needs.

It is added that when the new owners took possession of the works on Jan. 1, 1920, there were still unexecuted orders for about 300,000 tons taken at prices which did not correspond to the costs of manufacture on account of the non-delivery of German fuel. The new owners contended that they were not obligated to fill these orders, awaiting the solution of the controversy, but expressed a willingness to enter substitute orders at prices ruling at time of delivery, subject to a possible rebate fixed by an arbitration commission. The British agents claim that many foreign and French clients accepted the proposition. The customers were given until April 20 to exercise their option, and it was indicated that they might otherwise have a claim through a court, with the intimation that this was not likely the most satisfactory way of effecting a settlement.

War Claims Experts Form Engineering Company

Members of the technical advisory committee, who were instrumental in the settling of more than $3,000,000,000 worth of war contract claims for the War Claims Board, have opened headquarters at 132 Nassau Street, New York, under the name of the Technical Advisory Corporation to serve private manufacturing plants in engineering and industrial matters. Members of the technical advisory committee who have completed their war contract work and are now engaged in strictly peace work, are Campbell Scott, New York, president of the Technical Advisory Corporation; Ernest P. Goodrich, New York, vice-president and treasurer, a specialist in waterways and the designer of the Bush Terminal, Brooklyn; William D. Ennis, New York, vice-president and secretary, specialist in fuel, power and manufacturing; Col. Frank B. Maltby, Philadelphia, who built the railroad docks, terminals and warehouses at St. Nazaire, France, for the A. E. F. and formerly chief assistant engineer of the Panama Canal; Walter Rautenstrauch, Columbia University, New York, specialist in manufacture of machinery and steel products; George B. Frankforter, Minneapolis, chemical specialist and dye expert; Arthur W. Hixson, New York, specialist on fuels, heavy chemicals, plant design and general manufacturing; Fred E. Rogers, New York, expert machinery designer and former Editor of *Machinery*, and Rumsey W. Scott, New York, experienced in industrial transportation and the handling of equipment.

In connection with the recent purchase of the blast furnace property at Goshen, Va., by the Goshen Furnace Corporation from the Southeastern Iron Corporation, E. Arthur Tutein, Inc., Boston, a Massachusetts corporation, selling agent for the Goshen iron, recently increased its capitalization from $350,000 to $500,000 by an issue of 1500 shares, par $100, of which 497 are issued, bringing the total amount issued up to 3997 shares and leaving 1003 shares in the treasury. E. Arthur Tutein is president and treasurer, and John M. Bullard is vice-president. Tutein, Inc., was incorporated in the early part of the year.

The Union Railway Equipment Co., Chicago, has purchased a large tract of land at Hammond, Ind., and is now erecting shops for the manufacture of railroad freight car specialties. The plant when completed will total an investment of approximately $1,500,000.

ESTABLISHED 1855

THE IRON AGE

EDITORS:

A. I. FINDLEY WILLIAM W. MACON GEORGE SMART

CHARLES S. BAUR, *Advertising Manager*

Member of the Audit Bureau of Circulations and of Associated Business Papers, Inc.

Published Every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

W. H. Taylor, *President and Treasurer* Fritz J. Frank, *Vice-President* George H. Griffiths, *Secretary*

Owned by the United Publishers Corporation, 243 West 39th Street, New York. H. M. Swetland, *Pres.* Chas. G. Phillips, *Vice-Pres.* W. H. Taylor, *Treas.* A. C. Pearson, *Secy.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: Tremont Building. Philadelphia: Real Estate Trust Building. Cleveland: Guardian Building. Cincinnati: Mercantile Library Building. Washington: 613 Fifteenth Street, N. W. San Francisco: 320 Market Street.

Subscription Price: United States and Possessions, Mexico, Cuba, Shanghai, $5.00; Canada, $7.50; Foreign, $10.00 per year. Single copy, 25 cents.

Entered as second class matter, June 18, 1879, at the Post Office at New York, New York, under the Act of March 3, 1879

Present Price Tendencies

It is not always safe to determine the real importance of a movement, or tendency, by the amount of publicity which it obtains. A striking illustration of this fact is shown by the countless columns of space which the newspapers have devoted recently to the reduction in prices, principally by department stores dealing in dry goods. Newspaper men, with keen intelligence as to news values, realized the tremendous interest of people in general in the increased cost of living and knew that all news indicating a reduction in the cost of living would be read with avidity by nearly everybody. Hence it was not surprising, when a few large department stores announced cuts of 20 to 30 per cent in prices, the metropolitan newspapers gave a large amount of space to news of this kind and by telegraphing to all parts of the country encouraged others to follow the example of a few in the larger cities. The result has led to the slashing of prices and the causing of general uneasiness in the business world.

While this price cutting has probably received more attention than it deserved, there is no doubt that a substantial reduction, particularly in men's and women's garments, has been made, and with good reason. Evidence is not lacking that many retail stores accumulated unusual stocks with the confident expectation that owing to the war profits enjoyed by a certain number of people and the probability that the cost of raw materials would not be lowered, these stocks would easily be disposed of at handsome profits. The storekeepers had not however realized that although some who profited by the war would continue extravagant buying, a great majority of their customers would be compelled to economize, and in fact were economizing to an extent not generally appreciated.

The attitude of the buyers and also the policy of the banks in encouraging liquidation of stocks and declining in many cases to make further loans, compelled the lowering of prices, which, in many cases, were exorbitant. This was an entirely proper proceeding, but it furnishes no reason for entertaining pessimistic views as to what will happen to business in general. Conditions in other lines are very different. This is particularly true of the iron, steel and machinery products, of which the stocks are very low, almost the only accumulations being due to the inability of manufacturers to ship during the past few weeks. Banks certainly have not called upon these manufacturers to liquidate their stocks and there has been no evidence of a speculative tendency. All but a small percentage of the tonnage of iron and steel manufactured has been sold at moderate prices, the occasional exception being furnished by premiums paid for quick delivery of finished products. The present reduction of dry goods and other articles is not likely to have any effect on prices of iron, steel and machinery, except to check the upward tendency and cause the disappearance of the premiums.

Slowness in the improvement in the transportation situation is discouraging, but it is clear that there is some improvement and, with all the activity of Government, railroad and business agencies to relieve the situation, it is reasonable to expect that the improvement will continue. It also seems probable that before many months railroads will be so financed that they can make very large purchases in rolling stock, rails and machinery. The whole world needs iron and steel in larger quantities than can be manufactured. The crop outlook, although not so favorable as in bumper years, is much better than it has often been. These and other favorable factors promise to prevent any sudden or too deep cut of prices.

In these days of standardization of practice, there is interest also in standardized nomenclature. The effort of a leading manufacturer of turret lathes and screw machines to establish the use of the term turret lathe in preference to "screw machine," as applied to tools which perform a different class of work than the hand screw machine was at one time used for, is a case in point. Users and makers of machine tools have for years clung to the designation, "hand screw machine," although such tools are now seldom, if ever used, for screw work. In fact, the automatic machine has almost entirely supplanted the hand

machine for screw making. The screw machine, so-called, or the turret lathe, is now used principally for chucking work. The significance of the campaign of this manufacturer to bring about the elimination of the term screw machine is that some manufacturers have already dropped the designation, while others still cling to it. A uniform practice would serve to eliminate confusion, and, moreover, will better indicate the greater field of work which this type of machine tool now covers.

A Transportation Experiment

The transportation act of Feb. 28, 1920, was less than three months old when an experiment on a very large scale was begun under it. With the new powers granted it by the act, the Interstate Commerce Commission is endeavoring to effect the movement of the commodities that most affect the public and to reduce a traffic congestion that has been throttling manufacturing and commerce generally. This is an experiment of the most vital importance, and the public must view it as such.

For years we have been wondering what we ought to do with our railroads. After much discussion the new transportation law was enacted, and the act has been very generally approved, the only loudly dissenting voices being those of Samuel Gompers and others who have objected to the labor provisions. If conditions do not prove satisfactory, the experiment of Government operation, including in substance Government ownership, can hardly be avoided. The present transportation act, in the opinion of men who have followed the subject closely, provides the only trial that can be expected of private ownership and operation of the railroads. All developments in this trial, therefore, are to be watched with the greatest interest.

The Interstate Commerce Commission's present effort to improve traffic conditions was undertaken after leading railroad executives had asked the commission to act, but the new law gives the commission the power to act without such request. The language of the law regarding car service rules, routing, etc., is: "Whenever the commission is of opinion that shortage of equipment, congestion of traffic, or other emergency requiring immediate action exists" it may proceed at once, being answerable to no one, and money penalties are designated for failure of carriers to obey the orders issued.

The commission has its own observers in the field, it has the advice of railroad executives, and it is in close touch with shipping interests and their traffic managers, who are able to give important information and advice. Thus the experiment is a crucial one, and if there is failure, no fresh experiment of this general character can be proposed. An entirely new basis for the conduct of transportation in the United States is the alternative.

The shippers of the country wish the Interstate Commerce Commission success in this operation and entertain definite expectations that sufficient improvement in traffic conditions will result to make it clear that the powers provided by the transportation act are useful. Success of the experiment, as an experiment, does not require that the traffic congestion be ended entirely, but that a reasonable improvement be seen, attributable to the operations conducted under the new law.

If these efforts succeed, the success will show that strikes by railroad operatives cannot be as effective with the new transportation act in force as they would have been under former conditions. That would be a separate and distinct advantage in the matter of strikes being avoided, apart from the requirement of Section 301, that "it shall be the duty of all carriers, and their officers, employees and agents, to exert every reasonable effort and adopt every available means to avoid any interruption to the operation of any carrier growing out of any dispute between the carrier and the employees or subordinate officials thereof."

The amount of idleness of workmen at the present time is such as justify expectations that a noticeable change in the mental attitude of labor generally will be produced. For a long time, the job has sought the man, and workmen all seemed convinced that they need have no care for themselves, that wages would always be offered for any degree of performance they chose to offer. And the complaint has been heard several times lately that the iron and steel industry has not helped in its taking into employment numbers of the striking railroad workers. These last are without strike benefits and without a voice in the councils of the Railroad Labor Board. In each of several industrial centers, tens of thousands of men are idle as a result of the railroad strike, while there are various separate strikes, many of which do not promise results satisfactory to the men. In some quarters, it has been urged for months past that labor needs "the rest cure" through there being a period of industrial inactivity. Such a cure is now being taken by not a few men and were it a case of a little leaven leavening the whole loaf, the results, as to more efficient and enthusiastic labor performance in future, would not be in doubt.

British trade papers are recently commenting freely on the use of substitutes for ferromanganese. According to official data the present output of blast furnace ferroalloys, of which the major portion is probably ferromanganese, is only 16,000 tons per month, as against 27,000 tons per month in 1913. This is reflected in advancing prices and in reduced exports to other countries, particularly the United States. An interesting statement is that British steel makers are using calcium silicide, it having been found in practice that one pound of this material effects a saving of about 25 per cent in the quantity of ferromanganese used. Arguments are being advanced for the use of silicomanganese alloys, the statement being made that these are more economical when possible to use them. Even these are sharply advancing, alloys showing 45 to 50 per cent of manganese and 20 to 25 per cent silicon selling at £55 per ton, while alloys containing 65 to 75 per cent manganese and 10 to 12 per cent silicon are being offered at £65 per ton. These prices are higher proportionately than for the regular manganese alloy. Calcium silicide, which is an electric furnace product, was used quite extensively during the war by certain British steel makers and a large quantity was bought by the Germans before the war from French

producers. Its use by American steel plants has been almost nil even in an experimental way, though calcium in another form was tried. The British results will be watched with interest, particularly in reference to the discussion which prevailed among American metallurgists during the war.

Steel Production Abroad

The American iron and steel industry has had irritating experiences in the past eight months in the matter of production, being hampered successively by the iron and steel strike, the coal strike, the car shortage and then the rail strike. Previous to eight months ago, production had been restricted by lack of orders sufficient to engage the full capacity. Other producing countries, however, have had their difficulties. In Belgium and France, there are potentialities rather than realities, while on account of the restoration of Lorraine to France the productive capacity of Germany has been reduced much more than the consumptive capacity. The three countries are not now important factors in the export market.

The case of Great Britain has appeared altogether different. British exports are heavy. The British iron and steel industry, however, has not been having plain sailing, or else the estimates of the increase in productive capacity during the war were erroneous. Statistics of the production of steel ingots and castings in the United Kingdom show that the rate of output in the first quarter of this year was 30 per cent greater than the average rate in the second half of last year, but even with this increase the rate is only 9,400,000 tons a year, when 12,000,000 tons has been spoken of as the capacity. There is, however, a large gain over the best rate attained before the war. The following table puts the presentation in a nutshell, showing the best pre-war year's production, the best war year's production, and recent rates of production per annum, all in gross tons:

1913 production	7,835,113
1917 production	9,804,079
Rate, second half 1919	7,250,000
Rate, January, 1920	9,400,000
Rate, February	9,200 000
Rate, March	9,600,000

The rate in March approached very closely the average rate in the best war year and was 23 per cent above the rate in the best year before the war.

In the United States the highest rate of production since the armistice was shown last March, when the production of steel ingots was at the rate of 45,200,000 tons a year, this being a materially higher rate than prevailed throughout any previous calendar year. It was a rate 50 per cent greater than obtained throughout any calendar year prior to the war, this 50 per cent comparing with the 23 per cent gain shown for Great Britain by a similar comparison. The British production just quoted, being for steel ingots and castings, is not comparable with the American rate mentioned, which is for steel ingots only. The production of steel castings in the United States cannot be estimated closely. Such production amounted to 1,020,744 tons in 1913, but rose to 1,441,407 tons in 1917.

On the whole, the British steel industry is probably functioning rather well, but the stimulus of extremely high prices must be considered, and it is quite possible that production has been forced and production costs thus increased. As for France, with the large iron ore reserves at command, combined with a shortage of fuel and uncertainty as to the building and repair of furnaces and mills, actual performance will be the best criterion of France's future as an international competitor in iron and steel.

The Institute's Spring Program

An unusually interesting and valuable program has been prepared for the annual spring meeting tomorrow in New York of the American Iron and Steel Institute. Its diversity is a feature and some unusual results in American metallurgical practice are to be divulged. As usual the important departments of the industry are to be represented.

In blast furnace metallurgy the use of oxygen as an enrichment of the blast will be discussed by Dr. F. G. Cottrell, recently made head of the United States Bureau of Mines. The acid open-hearth process will be discussed in a paper which is the second in a series, forecast last fall and introduced by Dr. H. M. Howe, which series will constitute a highly authoritative book on the subject. New developments are promised in the use of the microscope in the study of the constitution of steel by Dr. Albert Sauveur. A report of the progress made in the researches on the fatigue of metals will be presented by one of the investigators. One of the most important papers will discuss a new method of making pipeless rolled products from annular blooms, a contribution which may prove to be epoch-making or at least blaze the way for decidedly changing some of the present methods.

Because the attendance dwindles 50 per cent or more immediately after Judge Gary's presidential address, some consideration is being given to the proposition to devote two days to the convention. It is realized that these meetings bring together a larger representation of the steel industry than any others. A change such as suggested would afford more time for the valued interchange of ideas and possibly work for a better attendance at the technical sessions, whose high merit demands it.

The announcement made in this issue of THE IRON AGE that a Cleveland company has agreed to a plan proposed by its employees to reduce the daily working period from nine to eight hours on condition that the production shall be as great in the shorter as it has been in the longer period is important not merely because it provides for cutting off an hour of the working time of a few hundred employees, but because of the spirit of co-operation between the company and men that is indicated. The working out of the experiment will be watched with deep interest, as it will show what can be done in a short period when employees really want to do it.

Only recently have the data of the French steel industry during the war been made public. There was very little diminution in the open-hearth steel output, the chief decline having been in Bessemer

steel. In 1913 the open-hearth production was one-third of the total for the country; in 1918 it was three-quarters of the total and only 275,000 tons less than in 1913. The important rôle which this steel played in the war is realized by the fact that of a total production of all grades of steel in 1918, of 1,807,931 tons, 1,312,625 tons was open-hearth, while in 1913 this grade of steel was 1,582,478 tons out of that year's total of 4,686,886 tons. The crucible steel output in 1918 was double the 1913 production and the electric steel production three times in 1918 what it was in 1913. Apparently relatively little effort has been made to rebuild the Bessemer apparatus destroyed in the war.

Domestic Output of Manganese Ore Small in 1919

WASHINGTON, May 25.—Continued decline in imports and diminishing domestic production has resulted in an increase in price for the remaining stocks of manganese in the United States, according to a preliminary survey by the U. S. Geological Survey. The general decline in the domestic production of high-grade manganese ore, which began early in 1919, continued throughout the year. During the last quarter the shipments of high-grade ore containing 35 per cent or more of manganese amounted to only 4069 gross tons. Most of this ore was shipped from Montana. During the same period the shipments of manganiferous ore containing 10 to 35 per cent of manganese amounted to 120,243 tons. Of this quantity about 96,221 tons came from Minnesota, 18,240 from Nevada, 3965 from Michigan and 1000 tons from Virginia. The shipments of ore containing 5 to 10 per cent of manganese amounted to 24,921 tons, of which 24,597 tons came from Minnesota.

The extent of the decline is measured by the fact that in 1919 total shipments of 35 per cent ore were 58,085 tons as compared with 305,869 tons in 1918, the number of shippers being 35 and 24 respectively. Of 10 to 35 per cent ore the 1919 shipments were 287,782 tons against 902,946 tons in 1918.

Facts About Coal Storage

WASHINGTON, May 24.—The railroad situation has made the question of coal storage of greater interest than ever. As a result, the Bureau of Mines has issued an instructive primer concerning the detailed methods by which coal may be safely stored. This document, prepared by H. H. Stoek, a consulting engineer of the bureau, treats of the various problems connected with the storage of coal in large as well as small quantities. It is of particular importance because it outlines the methods by which spontaneous combustion may be detected and prevented. It also itemizes the more important precautions which are necessary to prevent losses by depreciation as well as the peril of heating.

The document also gives a list of public bulletins and reports referring to the same subject.

Southern Export Shipments

BIRMINGHAM, ALA., May 24.—The Chickasaw City is on her way to Rotterdam with a cargo of Birmingham steel shapes. City of Birmingham is about to leave Mobile for Japan with a similar cargo. The Chickasaw Shipbuilding & Car Co. of Mobile, which built these two and another 9600-ton steel freighter, will launch the fourth, Mobile City, on May 27. Ten others of similar size are to be built. The two first are coal burners, the others will use fuel oil.

Milwaukee Conditions Improve

MILWAUKEE, WIS., May 24.—Traffic conditions at Milwaukee are improving gradually and it is now believed that betterment will continue in such measure that there will be no necessity for local industries to reduce forces materially because of the shortage of raw and semi-finished materials. So far as can be learned, practically no metal-working or other industry has been compelled to restrict production and lay off employees on this account. Even shipments from the Pittsburgh district to Milwaukee are coming through by rail with better facility. While the traffic situation is far from satisfactory, it is improving in a most encouraging manner, according to the heads of large as well as small industries.

New Mills at McDonald

YOUNGSTOWN, OHIO, May 24.—A new 13-in. mill, capable of producing bands up to 45 in. wide, will be ready for operation about June 1 at the McDonald works of the Carnegie Steel Co. Rolls have been tested. Two other mills are being installed.

The Electric Alloy Steel Co. plans to begin production about July 1 at its plant in Charleroi, Pa., purchased from the Universal Steel Co. The principal equipment, housed in three main and several subsidiary buildings, consists of one six-ton electric furnace, two crucible furnaces, 10-in. and 14-in. bar mills.

CONTENTS

Steel Ingots of Small Cross Section....1497
The Tilting Open Hearth's Future in France....1499
Engineering Foundation Seeks Large Endowment....1500
Code Calling Systems in Steel Plants....1501
Steel Exports to Burma....1503
Multiple-Spindle Dividing Head....1504
Recent Developments in Oxygen Cutting....1505
Individual Ingots for Tires and Wheels....1507
Pittsburgh Valve Foundry & Construction Co. Dedicates New Pipe Shop....1509
Chrome in the Caribbean Countries....1509
Design of Open-Hearth Furnaces....1510
Labor: Interesting Test of Comparative Production—Station Agents Omit Strike Authorization—Changed Attitude at Detroit—Novel Buying Plan—Rapid Advance of Wages—Homes for Workers—Cincinnati Strike Failing—In the Field of Labor—Opposed to Stock Dividend Tax....1513-1514
Track Scales for Light and Heavy Service....1515
Automatic Control of High Temperatures....1516
Superior Mine Leases....1517
Combustion Recorder for CO and CO_2....1518
National Machine Tool Builders' Association Meeting at Atlantic City....1519
Youngstown Steel & Tube Co. Office Force Reduced....1522
Shortage in Canada....1522
Meeting of Metal Branch of National Hardware Association at Cleveland....1523
Early Decision Urged....1524
Supply and Machinery Manufacturers and Dealers in Convention at Atlantic City....1525
Turret Rotary Shear....1526
Crank Shaping Machines....1526
Large Economical British Power Station....1527
The Undelivered Steel from Lorraine....1527
War Claim Experts Form Engineering Company....1527
Editorials: Present Price Tendencies—A Transportation Experiment—Steel Production Abroad—The Institute's Spring Program....1528-1530
Industrial Relations Association of America Convention at Chicago....1532
Reduced Coal Output....1535
Important Orders of Interstate Commerce Commission....1535
Iron and Steel Markets....1536
German Iron Trade Grappling with Obstacles....1550
New French Companies....1551
Non-Ferrous Metals....1553
Personal....1555
Obituary....1557
Railroad Equipment Hearing....1557
Improved Conditions in Youngstown District....1558
City of Superior Urges Speedy Decision on Pittsburgh Basing Point....1558
Correspondence....1559
Short Trade Items....1565
Machinery Markets and News of the Works....1566
New Trade Publications....1577
Office Changes....1577
Current Metal Prices....1578

Employers Are Blamed for Radicalism

Speaker at Industrial Relations Convention Says They Have Been Guilty of Almost Criminal Apathy — Serious Labor Problems Arouse Lively Discussion at Chicago Meeting

THE technique of industry, embracing all questions having to do with better manufacturing equipment and better methods of using it, has been the chief concern of industrial management for the past decade or two. While the best of brains have been engrossed in the problem of inventing new labor-saving devices and new systems to increase production, the most important element in production, the workman who operates the machine and conforms to the so-called efficiency methods, has been overlooked. That was the belief of the employers, employment managers, labor union leaders and disinterested economists who expressed their views at the annual convention of the Industrial Relations Association of America held at the Auditorium Theater in Chicago May 19, 20 and 21, but there were sharp differences of opinion as to the proper methods to employ to solve the problem. That the human element, finally, has been recognized as the most important factor in production was evident in the discussions.

Charles Piez, president the Link Belt Co., Chicago, stated that his experience with the Emergency Fleet Corporation and with his own company had convinced him that welfare work had been overdone and that the proper relationship between employer and employee was a business relationship only. A workman resents paternalistic efforts, particularly when they interfere with his liberty to seek his own amusement and lead his own life outside the plant walls. Mr. Piez cited a meeting held in Chicago some 12 years ago at which August Belmont recited what the street railway company in New York had done for its employees in the way of providing club rooms, equipped with billiard tables, bath facilities, etc. He was followed by the head of the street railway employees' union, who stated that the men did not want a bath tub in a club house, but sufficient wages to put tubs in their own homes.

Touching on the same subject, C. A. Lippincott, the Studebaker Corporation, South Bend, Ind., stated that the idea of welfare work handed down from above by philanthropist or employer was repugnant to the average self-respecting workman. He expressed the hope that the day will never come when a workman will accept a gratuity willingly. It should be borne in mind, said Mr. Lippincott, that far more valuable to the worker than material gifts is that priceless jewel, his self-respect.

The activities of well-meaning but sentimental welfare workers have won nothing but the suspicion of labor and have been productive of such uncomplimentary epithets as "slush hound," said Dudley R. Kennedy, counsellor in labor employment, Philadelphia.

Closed Versus Open Shop Discussion Interesting

The question of the closed versus the open shop received much attention in the proceedings and generated sharp clashes of opinion. Mr. Piez, in his address, was outspoken in his criticism of the closed shop. He stated that 12 year ago his company went over to the open shop after the union had violated four agreements in five years. By a specific example drawn from his own experience he illustrated how the closed shop restricted production. The standard output of rollers in his Chicago foundry, he said, was 60 a day. Convinced that this output was far below what it ought to be, he wagered the shop steward that a green man taken from the machine shop could turn out 100 rollers. The man's production for the first day was 96, and for the past 12 years the average output per man per day has been 180, or three times the standard under the closed shop. Mr. Piez stated that the piece work scheme of wage payment had been in many cases overworked, but nevertheless the only common sense way of paying labor was in proportion to production. One of the worst things done during the war, he said, was to separate wages from their relationship to output.

Mr. McCone Makes Charges

In discussing this subject, E. J. McCone, general manager, the Buffalo *Commercial*, made the sensational statement that his journal was the only militant open shop metropolitan newspaper in America. He charged that the International Typographical Union had censors in practically every daily newspaper plant in the country whose duty it was to prevent the publication of anything on behalf of either the open or closed shop. There are 1796 daily newspapers voicing the same number of views on every other question; yet what a startling unanimity of policy on this subject. To back up his statements Mr. McCone announced that he would give $10,000 to any one who would send him a clipping from a newspaper published since 1917 disproving his charges. He stated that he was not opposed to union organization *per se* but denied the right of any organization to take away from a workman the right to settle his own terms of employment, if he chose to do so. The union members, he said are slaves of the business agent, whom he likened to the Irishman at the Jewish wedding—no one invited him in and no one had the nerve to invite him out.

Labor Leader on Closed Shop

Mr. McCone was followed on the platform by Sidney Hillman, general president, Amalgamated Clothing Workers of America. Mr. Hillman denied that the question of the closed or open shop is the one confronting industry to-day. The purpose of industry, he said, is to produce, and the vital problem of the day is how to make men and women produce. To find fault with labor by saying that it is "lying down" on production is no answer to the problem. If it is possible to make people work by securing injunctions, calling them Bolsheviki, or deporting them, that is an answer, even if an unjust one. But the experience of the past few months indicates that those methods are fruitless. To be sure, the miners did not get six hours a day, the men went back to the steel mills and the railroad strike was called an outlaw strike, but nevertheless production was seriously interfered with. Mr. Hillman denied that labor organization is necessarily synonymous with restricted output, calling attention to the action of his association in a recent convention where the establishment of standards of production was adopted as a national policy. His union, he pointed out, worked with good results under both closed and open shop conditions. He stated that he does not wish to

quarrel about the particular form of the relationship of labor to management, as long as some heed is given to the wishes of labor regarding working conditions and wages are paid which insure workers a decent living. He cited low wages which prevailed before the men and women in his industry had effected a strong organization. Labor, he said, will welcome any innovation which will relieve it of the harder tasks so long as that innovation is not synonymous with unemployment. Unions, he said, owe their existence to the necessity for the worker's self protection. A labor leader, he asserted, cannot take thousands of men away from their jobs for a protracted period unless there is something the matter with the jobs.

Open Shop Won the War, Declared James A. Emery

"The open shop won the war," James A. Emery, counsel, National Association of Manufacturers, said in effect. Ninety per cent of the American industry serving the country in its struggle against the enemy was operated on the open shop principle. On the other hand, when Great Britain entered the conflict, 90 per cent of its industry was closed shop, but the restriction of production under that scheme of operation was so marked and so serious in the country's time of emergency that in 1915 the Government induced the unions to abandon their hampering regulations until the close of the war.

Labor Traditions and the Closed Shop

The closed shop is an evil, said Prof. John R. Commons, University of Wisconsin, but the alternative, unfortunately, is not between an evil and a perfect remedy. Present day views of labor unions, he stated, are born of past experiences, and this should be taken into consideration when the opinions of workmen are judged. Ever before the worker are the spectres of poverty and unemployment and he is therefore jealous of any advantages he has gained which he thinks make for his security in his vocation. Professor Commons told how 30 years ago he himself was employed as a typesetter in a Cleveland newspaper office. At that time, printers worked 11 and 12 hours a day and seven days a week, and the average wage was $15 a week. In the early nineties the linotype machine was introduced and it was feared by the men that wages would be reduced and their places taken by women. Through the efforts of the union organization, however, the old men were given the first opportunity to learn to operate the machines, hours were reduced from 11 and 12 to 7 and 8 and wages gradually rose to much higher levels. In some other industries where the open shop has prevailed, workmen have not fared so well. Naturally, therefore, the printer's present condition is attributed to the union and to the closed shop, and labor regards with suspicion promises of higher wages and improved working conditions to follow the introduction of the open shop. Professor Commons stated, however, that closed shop sentiment and union strength had lost their importance in many highly organized industries which he had recently investigated. There such superior conditions obtain that the labor agitator soon learns that his efforts are making no headway and departs for more fertile fields.

What Does the Workingman or His Wife Want?

"Every intelligent manufacturer in this country intends to satisfy every legitimate want of labor," declared C. A. Lippincott, The Studebaker Corporation, South Bend, Ind. But the question arises: What does labor want? Some think labor wants higher wages, but granting them does not solve the problem. Others are of the opinion that the workman wants a larger share in the management of industry, but steps in this direction have not met with uniform results. Plans have been proposed to give him a greater share in the direction of his own labor and the determination of his working conditions, and a greater share in the results of his labor. Experience up to date has not proved that any of these measures satisfy the wants of the workman. Perhaps, Mr. Lippincott suggested, the solution of the problem lies in finding out what the workman's wife wants. The average man aspires to provide for the comfort, health and happiness of his family. This means a good home, a home where he can take refuge from the cares and noise of the day, a home where he can rear his children to a sturdy and well-equipped maturity. The importance of the home to the security of the nation was brought out, he said, by the war. In England the laboring class did not respond to the call to arms as quickly as those higher up in the economic scale and the reason for it Mr. Lippincott stated, was that despite her marvelous achievements in civilization, England had more poverty than any other great nation. A man's patriotism gets much of its impetus from his pride in his home and his zeal to defend it and all it stands for. A large body of unanchored and poorly paid labor, such as existed in England, naturally reacted differently under the call for volunteers than those who had homes to defend.

Granting that it is desirable for every workman to own his home, there are certain obstacles in the way of achieving that end which, strange as it may seem, emanate from the worker himself. Labor fears that its bargaining power is impaired when its freedom to change employment is limited. This fear, said Mr. Lippincott, is not entirely without foundation. He cited a specific instance of a city where employers had refrained from granting wage advances proportionate to rising living costs because most of the workmen owned their homes and it was known that they would hesitate to leave them. Another obstacle is that many workmen are unable to make even a modest initial payment on a home for fear that they can't keep up with subsequent installments. Companies must be careful how they assist the men, if they think that no other plan will work. Workmen object to gratuities and justly so. To overcome this difficulty, the Studebaker Corporation has made it plain to the men that it is distinctly benefiting by reducing its labor turnover. Consequently, a man who remains continuously in the service of the company for a term of years has helped reduce the cost of operation. In the application of this principle to the housing question, the company has undertaken to remit a progressively larger share of the total cost of the house plus the accrued interest as the purchaser's length of service increases.

One of the greatest advantages of the "own your home" movement, Mr. Lippincott said, is that it will stimulate thrift, now woefully lacking in all walks of American life.

The importance of thrift was also touched upon by Mr. Piez in his address. A bank account, he said, will turn a radical red into a satisfied law-abiding citizen.

Radicalism the Child of Misunderstanding

It was generally recognized by the various speakers at the convention that radicalism had secured a foothold because workmen did not know the facts regarding the conduct of the industry with which they were identified. Through the apathy of the management and the zealous activity of agitators disseminating misinformation, they had acquired the most grotesque notions regarding the relation between profits and wages. It was the consensus of opinion that the foreman is best qualified to set his men right, but at the same time it was felt that much must be done by the management and the industrial relations representatives

to give him the information he needs, of which he often knows little or nothing himself. Too often the only instruction a new foreman gets is to take his desk and to get out production. He receives no advice regarding what he considers to be the private affairs of the company and doesn't expect to receive any. In matters relating to the policy and financial condition of the industry he is, in the words of Mr. Kennedy, a non-conductor. Details as to how foremen are educated for their duties in this connection were presented in an address by A. C. Horrocks, director of education, Goodyear Tire & Rubber Co., Akron, Ohio.

A Lumber Jack on Radicalism

Much interest was aroused by the talk of Sherman Rogers, a former lumber jack in the state of Washington.

"I am not speaking from theory," said Mr. Rogers, "I am not going to give you any ideas I have acquired in the ante-room of a college. My education was received on the long end of a double-bitted axe.

"The radical of this country is the result of an almost criminal apathy on the part of employers and Americans in other walks of life who are so prone to wrap the American flag around themselves and boast of their hundred per cent Americanism. If these same people would have taken as much of their valuable time in educating the workers of this country regarding actual industrial statistics as the radical agitators have in reaching the workingman with inflammatory false documents, a dyed-in-the-wool radical would be a very hard man to find, and if real Americans, both employers and others, would have familiarized the working men of the country with the truth years ago no radical agitator could ever have caused any marked disturbance anywhere.

"For the last two years there have been between 35,000 and 40,000 wide-awake radicals who have rolled up their sleeves and have gone down into the mine, mill, lumber camp and every other kind of industry in the United States, have mingled with the workers, have met them on their own ground and have poured out their radical teachings in a vigorous manner. They have succeeded in convincing hundreds of thousands of honest working men that the United States Government is ruled by a few cold-blooded Wall street magnates; have convinced them that greedy capital controls senates and houses, both State and National; have convinced them that corporations control the courts, and have thoroughly convinced scores of thousands that capital is making from ten to one hundred times the amount of profit that actually is made. In other words they have convinced the workers that it is extremely foolish to work hard for eight hours when six hours of that hard work goes into the bosses' already swollen pocketbooks.

"While this army of radical agitators has been industriously working 24 hours a day implanting gross misrepresentations in the minds of the workers, what have the employers and other Americans done to get the truth to this same worker? Until a few months ago practically nothing had been done to educate the worker along the lines of truth. Is it any wonder that not only working men, but thousands of men in other walks of life, have fallen for the bunk arguments of the agitator? I say not a bit. The biggest wonder to me is that the agitator didn't cause a lot more trouble than he actually did. The present unrest is caused, not so much by the activity of the agitator as it is caused by the passiveness of the employer and other citizens who call themselves Americans."

Spiritual Values Affecting a Job

Whiting Williams, formerly manager of personnel, the Hydraulic Steel Co., Cleveland, who recently spent seven months as a laborer in industry working 12 to 14 hours a day, stated that 98 per cent of the workingmen are fair and reasonable people. If asked, they will tell you that if there is to be any welfare work, they want it on the job where they spend most of their waking hours. They want better working conditions and, more important still, better personal treatment. Mr. Williams recited his own experiences with foremen and employment managers who were unnecessarily surly and abusive. Employers should realize, he said, that the biggest problem with which they have to deal is human relationships which have their source in feelings rather than in reason. Hurt the sensibilities and pride of a worker, he stated, and you get into trouble.

Capitalism and Conservative Unionism

Labor does not believe it can ever successfully manage industry, said Professor Commons in his address. It tried co-operation and failed because it couldn't maintain discipline, or credit, or take proper precautions to cover depreciation. It tried the "one big union" idea under the Knights of Labor, and failed. It has advocated socialism, and it has tried politics. The old established labor organizations in this country are now the most conservative in the world. At the same time, the I. W. W. is the most radical, more radical even than the Russian Bolshevists. With these sharp contrasts confronting it in the ranks of labor, it would seem that American capitalism would do well to place dependence on conservative unionism as represented by the American Federation of Labor. The record of the A. F. of L. in disciplining its radicals has been an admirable one. It is only recently that it stood by the employers in Seattle, Winnipeg and in New York—in the case of the direct action printers. If capitalism succeeds in breaking down conservative unionism altogether, and this seems to be the hope of some, there will be no course left for the American workman but to follow his European brother on the road to socialism and other revolutionary tenets. The forces of management hold the key to the future in their hands.

Physical and Mental Training of Employees

Proper physical development of the workers was urged by P. W. Litchfield, vice-president and factory manager, the Goodyear Tire & Rubber Co. Mr. Litchfield contended that physical development should go hand in hand with mental progress. He declared himself as being in favor of shorter hours, provided that the men put in the spare hours to good purpose. Vocational study was suggested as one of the ways to put in this time to good advantage. He urged that close contact must be maintained with the workers, so that the management can know what labor really wants. Mr. Litchfield claimed that labor wants three things: a representation by vote in welfare matters which concern it; the opportunity to achieve indeterminate rewards on what it produces; an opportunity to acquire an interest in the industry in which it is engaged.

New Era in Industrial Relations Looked For

In his address of welcome, Cyrus McCormick, Jr., manager of works for the International Harvester Co., said that after the troubled days through which the country has been passing, a new sunrise for industry may be looked for. Both management and labor, he declared, are looking for a fair decision with reference to what each, in justice, is entitled to expect. Mr. McCormick said that in his opinion the most effective factor in establishing better relations in industrial plants would be a concerted campaign of education, one that would drive home to both workers and employers all the arguments on all sides of every issue. When both sides can see the big fundamental principles underlying the points in dispute he contended, there will be no more disorders. The present generation has a splendid chance to set new standards in industry, he contended.

Large Attendance

Over 1400 registered at the convention and hundreds of others attended the sessions, at times filling the theatre, which is the largest in Chicago. Numerous sectional luncheon and dinner meetings were held in conjunction with the main program.

The Martin Brass Foundry, Providence, R. I., is established at 799 Eddy St. The company formerly was located at Quebec, Can. It functions in brass and bronze castings and solder. P. A. Beaulieu is president and manager.

REDUCED COAL OUTPUT

Serious Danger of Shortage in the Northwest —Low Coke Production

WASHINGTON, May 25.—Danger of a serious coal shortage next winter has been emphasized by the latest figures of the Geological Survey. The production of soft coal, including lignite and coal coked, during the week ended May 15, decreased 319,000 tons from the amount of the preceding week, which also was far below normal. The further decrease was due to the gradual spread of the traffic congestion caused by the railroad workers' strike. Operations in every coal field north of Alabama and east of the Mississippi, and in some fields of the Far West have been either directly or indirectly affected. Partial reports receipt for the week ended May 22 indicated little, if any, improvement.

Bituminous coal operators declare that disaster threatens industries in the entire Northwest next winter. This section obtains its coal by Lake shipments during the summer months. Up to this time in the season 3,000,000 tons of coal have been shipped by Lake to the Northwest, but the actual shipment has been less than 1,000,000 tons. It has been impossible to make up this deficit by rail shipments from Illinois and Indiana mines because the latter have been running at less than 50 per cent of capacity on account of lack of cars. Ordinarily about 30,000,000 tons of bituminous coal from Pennsylvania, Ohio, West Virginia, Kentucky and Tennessee are shipped to the Northwest by Lake during the summer.

The traffic conditions threaten the most serious coal shortage and consequent shutting down of industries since the winter of 1917-18.

Average production of bituminous coal should run in excess of 11,000,000 tons a week at this season of the year, but the total during the week ended May 15 amounted to only 8,773,000 net tons. This was the smallest total since the week of April 24. The daily rate of production, 1,462,000 tons, was only 83 per cent of that during the first quarter of the year, and 70 per cent of that in October, 1919. The year 1920 is now 10,370,000 tons behind 1917 and 13,720,000 tons behind 1918, but is 34,600,000 tons ahead of 1919.

The production of anthracite, like that of bituminous, dropped back during the week of May 15 to the lowest level since April 24. The total production during the week is estimated at 1,726,000 tons, a decrease of 114,000 tons in comparison with the preceding week.

Beehive coke production also declined during the week. The total output is estimated at 348,000 tons or a decrease of 22,000 tons from the preceding week.

Important Orders of Interstate Commerce Commission

WASHINGTON, May 25.—The transportation situation has overshadowed all other matters in Washington during the past week. The Interstate Commerce Commission issued a number of orders designed to aid in clearing up the congestion.

What is designated as Service Order No. 1 suspended all rules and regulations as to car service and directed the roads to forward traffic by the most available routes without regard to the routing thereof made by shippers or by carriers or to the ownership of cars. Service Order No. 2 suspended all car service rules and ordered the relocation of open-top cars from western territory to eastern territory, naming the number of cars which each carrier must send east each day. Service Order No. 3 was similar to Order No. 2 except that it applied to eastern roads. This orders the relocation of all box cars from eastern and southeastern territory to western territory. Orders were issued in line with the efforts of the commission to relocate 20,000 box cars from the eastern territory to the lines west of Chicago within the next 30 days and transfer 30,000 open-top cars from the Middle West to eastern territory.

The Interstate Commerce Commission has arranged to establish terminal committees at the important terminals in the country. The personnel of each terminal committee will consist of a representative of the carriers, a representative of the shippers in the vicinity of the terminals and a representative of the State railroad or public utility commission if the latter desires to be represented, and an employee of the Interstate Commerce Commission, who will act as chairman. It shall be the function of the committee to study traffic conditions and make recommendations to the Interstate Commerce Commission.

Miners' Wage Agreement Signed

At Pittsburgh last week the Pittsburgh Coal Operators' Association and District 6, United Mine Workers, signed a wage agreement which will be in force for two years from April 1. It consists practically of the award made by President Wilson's commission, and gives the men an advance in wages of 27 per cent. The signing of the scale has been held up several weeks because the operators demanded the right to increase the rent of houses. This the miners resisted. The miners gained their point, except that they agreed that there shall be increased rents in the case of newly-constructed houses.

Construction Work at Johnstown

Construction will shortly begin on 100 additional dwellings for the Cambria Steel Co., at Johnstown, Pa. The 82 houses at the Franklin wheel works of the company are now well along toward completion. Contracts for a hospital and nurses' home, mentioned in the issue of Jan 1 in enumerating new construction in prospect, have been contracted for with the Mellon-Stuart Co., Pittsburgh.

A contract has been given the Semet-Solvay Co., Syracuse, N. Y., for by-product coke ovens at the Rosedale coke works of the company, and plans provide for a benzol plant to take care of the gas, tar and other by-products from an installation consuming 4500 tons of coal daily.

A Dwight-Lloyd flue dust sintering plant is to be built in the Hinckston Run district, north of the Cambria ore yards, and the clinker will be returned to the blast furnace as soon as made. The Mead-Morrison Mfg. Co., Boston, is building a new ore bridge for the Hinckston ore yard.

The provisions for building tank cars will increase the total output of the car shops from 38 to 60 daily.

Large Attendance Expected

The outlook is that the attendance at the meeting of the American Iron and Steel Institute at the Hotel Commodore, New York, Friday of this week, will break the record of the meeting of October of last year, when 1330 were in attendance at the banquet, the largest in the history of the Institute to that date. It is expected that about 1400 will be present Friday.

The opening address will be made as usual by Judge Gary and will be followed by the reading of papers at the morning and afternoon sessions. The banquet will follow in the evening.

The Armstrong Whitworth Co., one of the largest shipbuilding concerns in Great Britain, is endeavoring to place an order for 20,000 tons of ship plate with the Dominion Steel Corporation. The Government of New South Wales has been negotiating with the Canadian Government for 15,000 tons of ship plates. The Canadian Government has already disposed of 19,000 tons to other governments.

Iron and Steel Markets

THE TRADE RESIGNED

Hopeful for Better Industrial Situation

Slow Buying But Prices Strong—Normal Operation Weeks Away

Improvement in freight movements has been slower than expected. In view of the several weeks which must transpire before any approach is made to normal conditions, it is noteworthy that there is a growing resignation to this fact, with its likely salutary effect, particularly on labor. Fuel continues at the moment to be the first consideration of both mill and consumer, and naturally every effort is being made to move raw and manufactured materials.

Of the leading producing centers greatest relief from the traffic congestion appears in the Pittsburgh district. The scattering of railroad workers to lucrative employment, in some cases with municipalities, is checking rapid resumption of the railroads, and the now heavy use of of the motor truck for relatively short hauls promises to remain more general in the future. The Pittsburgh district has reached about 75 to 80 per cent of ingot capacity.

In Chicago little change for the better is discernible on the whole. The leading interest has banked two blast furnaces, but is operating there at 70 per cent of capacity, with the Inland Steel Co. operating at 75 per cent. The most notable degree of improvement has occurred in the western plants of the American Steel & Wire Co., which are again working at close to normal.

In Youngstown operations are more nearly on a 50 per cent basis, close to 10 per cent improvement having taken place.

Delivery uncertainties have chilled buying and the few cancellations reported are not indicative of any cessation in demand. Steel plates and structural material are easier, in part the result of diminished building operations in relation to large producing capacity, but marked firmness is noted in pig iron, in semi-finished steel, and in several forms of finished steel in which there has long been a pronounced scarcity, notably tin plate, of which it is predicted the supply will be 50 per cent short of the needs. In the interest of the canning industry it is not unlikely that if any priorities are exercised they will be in connection with tin plate.

The price situation in shapes and plates is that fewer mills are adhering to the top levels, but instead for early deliveries they are quoting $10 a ton closer to the Steel Corporation's prices for extended delivery of 2.45c. and 2.65c. per lb. respectively. In steel bars 4c. to 4.50c. is common for delivery in six weeks to three months and 3c. to 3.50c. if mills will accept commitments into the fourth quarter.

Prices in general are not only well sustained, but several advances have been made. Consumers are bidding against each other for coke and fully $2 more per ton has been obtained for both the furnace and foundry product. On 2000 tons of forging billets $85 per gross ton, Pittsburgh, was paid. About 1300 tons of wire rods were sold at $75, the price established a week ago, and 1500 tons at $80.

Several Western makers of bolts and nuts have advanced prices about 10 per cent, meeting an advance made in the East a month ago on bolts with cut threads, and going beyond the general scale in the matter of bolts with rolled threads.

An Eastern consumer of basic pig iron is in the market for 12,000 tons and another inquiry is for 9000 tons. Owing to the fact that its steel plants have been operating at a greatly reduced rate, due to the rail strike, the Republic Iron & Steel Co. will have about 25,000 tons of basic pig iron to sell for last half delivery. No notable sales of pig iron are reported, but prices are firm and Bessemer has been marked up 50c. in the Pittsburgh district.

Few sizable structural projects have been contracted for and in Chicago about half of the building trades is reported idle. The American Bridge Co. will supply 2425 tons for a highway bridge at Bismarck, N. D., and 1500 tons for a bridge in Alaska. For ore bins for the Cambria Steel Co. 2000 tons of structural steel will be required.

For railroad car work 20,000 tons was placed, part with the leading interest and part with the leading independent in Chicago. A Pacific Coast shipyard has bought 3500 tons material in addition to an earlier order of 27,000 tons. The Baltimore & Ohio is inquiring for 800 underframes, taking 3600 tons of steel work. The Atlantic Coast Line is in the market for 500 box cars and the National Railways of Mexico for 500 freight cars. The Illinois Central is inquiring for 50 locomotives.

Transportation congestion is worse in England. Two important mills have closed down, shipyards have had to lay off men, new vessel contracts are reported canceled and producers have placed an embargo on exports to neutrals. Booking of new business there is not encouraged and prices are maintained.

Pittsburgh

PITTSBURGH, PA., May 25.

The railroad strike situation in the Pittsburgh and nearby districts is slowly showing betterment, but is not gaining in improvement as fast as the railroad officials expected. It is true that hundreds of men that were on strike have gone back to work, but a larger number have drifted into other work that pays a much higher rate of wage, and many of these men will never return to the service of the railroads. The gain in stocks of finished iron and steel in the Pittsburgh, Youngstown, Wheeling and other districts, due to the strike, was less in the past week than in any previous week since the strike started. A number of very important shipping points that have been embargoed practically since the strike started are again open. Among these are Cleveland and important

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	May 25, 1920	May 18, 1920	Apr. 27, 1920	May 27, 1919
No. 2 X, Philadelphia‡	$47.15	$47.15	$47.05	$29.50
No. 2, Valley furnace†	45.00	45.00	43.00	26.75
No. 2 Southern, Cin'ti.†	45.60	45.60	45.60	29.35
No. 2, Birmingham, Ala.†	42.00	42.00	42.00	26.75
No. 2 furnace, Chicago*	43.00	43.00	43.00	26.75
Basic, del'd, East. Pa.	44.80	44.80	44.80	29.65
Basic, Valley furnace	43.50	43.50	43.00	25.75
Bessemer, Pittsburgh	44.40	43.90	43.90	29.35
Malleable, Chicago*	43.50	43.50	43.50	27.25
Malleable, Valley	44.00	44.00	43.00	27.25
Gray forge, Pittsburgh	43.40	43.40	42.40	27.15
L. S. charcoal, Chicago	57.50	57.50	57.50	38.85
Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill.	$55.00	$55.00	$55.00	$45.00
O.-h. rails, heavy, at mill.	57.00	57.00	57.00	47.00
Bess. billets, Pittsburgh	60.00	60.00	60.00	38.50
O.-h. billets, Pittsburgh	60.00	60.00	60.00	38.50
O.-h. sheet bars, P'gh.	80.00	80.00	80.00	42.00
Forging billets, base, P'gh.	80.00	80.00	80.00	51.00
O.-h. billets, Philadelphia	64.10	64.10	64.10	42.50
Wire rods, Pittsburgh	75.00	75.00	70.00	52.00
Finished Iron and Steel, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	4.25	4.25	4.25	2.595
Iron bars, Pittsburgh	4.25	4.25	4.25	2.35
Iron bars, Chicago	3.75	3.75	3.75	2.50
Steel bars, Pittsburgh	3.50	3.50	3.75	2.35
Steel bars, New York	4.02	4.02	4.02	2.62
Tank plates, Pittsburgh	3.75	3.75	3.75	2.65
Tank plates, New York	4.02	4.02	4.02	2.92
Beams, etc., Pittsburgh	3.10	3.10	3.25	2.45
Beams, etc., New York	3.27	3.27	3.52	2.72
Skelp, grooved steel, P'gh.	2.75	2.75	2.75	2.45
Skelp, sheared steel, P'gh.	3.00	3.00	3.00	2.65
Steel hoops, Pittsburgh	5.00	5.00	5.00	3.05

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheet, Nails and Wire, Per Lb. to Large Buyers:	May 25, 1920 Cents	May 18, 1920 Cents	Apr. 27, 1920 Cents	May 27, 1919 Cents
Sheets, black, No. 28, P'gh.	5.50	5.50	5.50	4.35
Sheets, galv., No. 28, P'gh.	7.00	7.00	7.00	5.70
Sheets, blue an'l'd, 9 & 10.	4.50	4.50	4.50	3.55
Wire nails, Pittsburgh	4.00	4.00	4.00	3.25
Plain wire, Pittsburgh	3.50	3.50	3.50	3.00
Barbed wire, galv., P'gh.	4.45	4.45	4.45	4.10
Tin plate, 100-lb. box, P'gh.	$7.00	$7.00	$7.00	$7.00
Old Material, Per Gross Ton:				
Carwheels, Chicago	$37.00	$37.00	$37.00	$20.50
Carwheels, Philadelphia	40.00	40.00	40.00	20.00
Heavy steel scrap, P'gh.	25.00	25.00	25.00	15.50
Heavy steel scrap, Phila.	23.00	23.00	24.00	15.00
Heavy steel scrap, Ch'go.	22.50	22.50	23.50	15.50
No. 1 cast, Pittsburgh	32.00	32.00	32.00	17.00
No. 1 cast, Philadelphia	*37.00*	38.00	38.00	21.50
No. 1 cast, Ch'go (net ton)	36.50	36.50	37.00	19.50
No. 1 RR wrot, Phila.	33.00	33.00	35.00	21.00
No. 1 RR wrot, Ch'go (net)	*25.50*	26.00	27.00	15.75
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$14.00	$12.00	$11.00	$4.00
Furnace coke, future	14.00	12.00	11.00	4.00
Foundry coke, prompt	15.00	13.00	11.00	4.50
Foundry coke, future	15.00	13.00	11.00	5.00
Metals, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	19.00	19.00	19.25	16.75
Electrolytic copper, N. Y.	19.00	19.00	19.25	16.50
Zinc, St. Louis	7.60	7.70	8.00	6.25
Zinc, New York	7.95	8.05	8.35	6.60
Lead, St. Louis	8.15	8.15	8.40	5.00
Lead, New York	8.50	8.50	8.75	5.25
Tin, New York	*51.00*	54.75	60.50	72.50
Antimony (Asiatic), N. Y.	9.25	9.75	11.00	8.25

The above prices are for domestic delivery and do not necessarily apply to export business.

points between Pittsburgh and Cleveland, also Brackenridge up the Allegheny River, and a number of points on the Monongahela River. The railroads claim that at the rate they are breaking in new men they will be back to normal conditions again inside of two weeks, but this is considered doubtful. Even were this to happen, it would take two or three months to move the several million tons of finished iron and steel in various forms that are piled in mill yards, mill warehouses, and loaded on cars that are not being moved. One leading interest had on Tuesday about 200 cars of finished sheets and tin plate loaded for shipment, most of it tin plate, and with little prospect of moving very many of these cars this week at least. The great trouble is to get empty cars, and the railroad officials claim they are working tooth and nail to get all the empty cars back to the Pittsburgh district that they possibly can.

The Pittsburgh & Lake Erie Railroad, a trunk line between this city and Youngstown, where it connects with the Erie for Cleveland, was hit worse by the strike than any other road. The Pittsburgh & Lake Erie was practically out of commission for nearly four weeks, but is now accepting some carload shipments and is moving some solid trains. The Pennsylvania Railroad is doing better than at any time since the strike started, and on Monday moved 49,679 cars in the Central district, between Altoona and Crestline, the heaviest freight movement in any one day since the strike started. On Wednesday, May 26, the Pennsylvania Railroad accepted shipments of freight for stations on the New York, New Haven & Hartford Railroad, in carloads and less than carloads, but would not accept any perishable freight. These shipments were received at different yards and then made up into a special train, which moved to New York without yarding. This road expects to send out a second train on Saturday next. The Baltimore & Ohio Railroad is nearly back to normal, and is again receiving freight for shipment to Cleveland and other points in western Pennsylvania and Ohio that have been embargoed since the strike started. The Bessemer & Lake Erie Railroad, owned and operated by the Carnegie Steel Co., reports it is back practically to normal conditions, and has about all the men it needs. It is strongly believed that within two weeks the railroad strike will be very close to being a thing of the past, but it will take two to three months to clear up the freight congestion, and it may take longer. Last Saturday and Sunday, railroad yards in the Pittsburgh and Connellsville districts were pretty well cleaned up, but the return of empty cars in large numbers, promised by the railroads, did not materialize to any great extent. The scarcity of empties is more acute than at any time since the strike started.

Very little effort is being made by either producers or consumers to do business, and there will likely not be until the strike situation shows a good deal of improvement. Truck delivery is getting to be common, though very expensive, and has helped out in the present strike a great deal. In fact, the use of trucks for deliveries from mills and warehouses to nearby consumers promises to be more general in the future, this being one result of the strike. Prices have not shown any marked decline, but the general tone is easier, excepting perhaps pig iron and several items of finished steel, in which there is a very acute shortage in supply, notably in tin plate, in which it is predicted there will be a 50 per cent shortage this year.

Pig Iron.—Not much is being done in the way of

selling pig iron, but inquiry for basic and Bessemer is fairly active. Here and there another blast furnace is starting, due to better coke delivery, but shipments are still very difficult. The Shenango Furnace Co. has started No. 3 at Sharpsville, and now has two going and one idle. The Carnegie Steel Co. has started two more furnaces, having 37 going and 22 idle. Blast furnaces report the movement of ore and coke as better than at any time since the strike started, but at some furnaces the supply of fuel is large enough for only two or three days' operation. We note sales of several lots of 500 tons each of Bessemer iron at $43 at Valley furnace, also small lots of basic at $43.50 and of No. 2 foundry at $45, Valley furnace. An eastern consumer has an inquiry out for 12,000 tons of basic, and there is another inquiry in the market for 9000 tons. The Crucible Steel Co. of America is in the market for some basic iron, but has not closed. The Republic Iron & Steel Co. will probably have 25,000 tons or more of basic iron to sell for last half delivery, its steel plants at Youngstown having been very seriously affected in operation by the railroad strike. For this reason the company has some surplus iron, while ordinarily it is a buyer of iron.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh districts being $1.40 per gross ton:

Basic	$43.50
Bessemer	43.00
Gray forge	42.00
No. 2 foundry	45.00
No. 3 foundry	43.50
Malleable	44.00

Billets and Sheet Bars.—There is fair inquiry in the market for Bessemer sheet bars and slabs, and some business is expected to be put through this week on Bessemer sheet bars on the basis of about $70 at mill, Pittsburgh. Open-hearth bars command a higher price than Bessemer, as they are more suitable for sheets for automobile purposes. Recently several sales of open-hearth sheet bars have been made at $85 or higher, the buyers being automobile builders who will have these bars rolled into sheets on a conversion basis. The output of ingots in the Pittsburgh district is now estimated at 75 to 80 per cent of normal, probably very close to the latter figure. In the Youngstown district, production of Bessemer and open-hearth steel is at a very low ebb, being under 50 per cent of normal.

We quote 4 x 4-in. soft Bessemer and open-hearth billets at $38 to $60; 2 x 2-in. billets, $42; Bessemer sheet bars, $42 to $70; open-hearth sheet bars, $42 to $80, and forging billets, ordinary carbons, $80 to $85 base, all f.o.b. Youngstown or Pittsburgh mill.

Ferroalloys.—There has been some movement in ferromanganese in the past week, mostly for delivery in this month and in June. We note sales of 400 to 500 tons at $240 to $250 per gross ton delivered. There has also been some movement in ferromanganese in the past week, mostly for delivery in this month and in June. We note sales of 400 to 500 tons at $240 to $250 per gross ton delivered. There have also been several sales for last half, aggregating 600 to 800 tons, at $200 per gross ton delivered for 80 per cent domestic. We also note a sale of 100 tons of 8 per cent silvery iron at about $55 per gross ton, delivered.

We quote 76 to 80 per cent domestic ferromanganese $200 for last half delivery and $250 for prompt delivery, with a reduction of $1.50 to $1.75 per unit for lower percentages. We quote 50 per cent ferrosilicon at $80 to $85 and 18 to 22 per cent spiegeleisen at $70 to $75, furnace. Prices on Bessemer ferrosilicon are: 9 per cent, $56.50; 10 per cent, $59.50; 11 per cent, $62.50; 12 per cent, $66.10. We quote 6 per cent silvery iron, $48.25 to $48.75; 7 per cent, $52.50 to $53; 8 per cent, $54.50 to $55; 9 per cent, $56.50 to $57, and 10 per cent, $59 to $59.50. An advance of $3.30 per gross ton is charged for each 1 per cent silicon for 11 per cent and over on Bessemer ferrosilicon, and an advance of $2.50 per gross ton is charged for each 1 per cent silicon for 11 per cent and over on silvery iron. All the above prices are f.o.b maker's furnace, Jackson or New Straitsville, Ohio, which has a uniform freight rate of $2.90 per gross ton for delivery in the Pittsburgh district.

Structural Material.—Local fabricators report inquiry very light and say they are booking less actual business than at any time for some months. The American Bridge Co. has taken 450 tons for a hot metal bridge for the Trumbull Steel Co., Warren, Ohio, and 2600 tons for an apartment on Broadway, New York, has been placed with the McClintic-Marshall Co., which has also taken 300 tons for an extension to a building for the Aluminum Co. of America, Arnold, Pa., also 800 tons of bridge work for the Union Pacific Railroad. One job in the market calls for about 2000 tons for new ore bins for the Cambria Steel Co., Johnstown, Pa. The Carnegie Steel Co. is still quoting 2.45c. for plain material, while the Jones & Laughlin Steel Co. is quoting 3.10c. to 3.50c., its prices depending on whether the inquiry comes from a regular customer. The Cambria Steel Co. is holding plain material at about 4c., Pittsburgh.

Plates.—Very few car orders are coming out, and inquiry is light. The Atlantic Coast Railroad has an inquiry in the market for 500 box cars. The inquiry for plates is not as urgent as it has been and some independent mills are seeking business more actively than for some time. The steel car companies are doing very little in new work and are not taking in more than 25 per cent of their normal needs of plates.

We quote sheared plates of tank quality, ¼-in. and heavier, at 2.65c. to 3c. for very indefinite delivery, while prices on ¼-in. and heavier plates, named by mills that will agree to ship out in three to four months, is 3.50c.

Sheets.—Operation of the sheet mills is better now than at any time since the railroad strike started. The American Sheet & Tinplate Co. is still operating to 80 per cent of hot sheet mill capacity, and the independent mills close to 75 per cent. Sheet bars are going forward to the mills better than for some time, except possibly in the Niles, Warren and Youngstown districts, where mills that make sheet bars are very badly affected by the railroad strike. The wide gap in prices on sheets between the independent mills and the leading interest is slowly being closed, and the very high premium prices that prevailed in the market some time ago have about disappeared.

We quote No. 28 gage box annealed one-pass black sheets at 4.35c. to 6.50c.; No. 28 galvanized, 5.70c. to 8.50c., and Nos. 9 and 10 blue annealed at 3.55c. to 6c., the lower prices named being the March 21 schedules, which are still named by the leading interests, while the higher prices represent a fair range of quotations by the independent mills.

Tin Plate.—The acute shortage in the supply of tin plate that confronts the trade has become so serious that last week there was a conference in Washington of members of the Interstate Commerce Commission and most of the tin plate producers, also the canners, and the American Can Manufacturers' Association, in order to talk over the situation to see if anything could be done to relieve the expected shortage in supply of tin plate, which is now estimated will be fully 50 per cent. The exact situation was put up to the Interstate Commerce Commission by the manufacturers of tin plate and cans, and also by the packers, and the members of the commission promised their full support in doing anything they can to relieve the situation. It may be that as a result of the meeting, tin plate for cans and other food containers will be put on the priority list. The American Sheet and Tin Plate Co. has close to 1,000,000 boxes of tin plate ready for shipment to customers that need it badly but cannot get cars. The Jones & Laughlin Steel Co. has 300,000 boxes piled up and all the tin plate makers have very heavy stocks either in warehouse or loaded on cars. Recently shipments of tin plate were made in gondolas, the buyers assuming all risks in transit. At present the American Sheet & Tinplate Co. is operating to about 50 per cent of tin plate capacity, being badly crippled at practically all its plants by the railroad strike. Most leading consumers of tin plates are covered on their needs for this year, but deliveries are very bad, There is an active export inquiry but local mills are not quoting.

We now quote tin plate to domestic consumers for remainder of the year delivery at $7 to $8.50 base box, stock items $9, and for export $11 to $12 per base box, all f.o.b. Pittsburgh.

Steel Rails.—The makers of light and standard section rails are sold up for the remainder of this year and are not taking on any new business. Most of the business in light rails is going to the rerolling mills.

The Carnegie Steel Co. is still quoting the March 21, 1919, prices, these being 2.45c. for 25 to 45-lb. sections, 2.49½c. for 16-lb. and 20-lb. sections, 2.54c. for 12-lb. and 14-lb. sections, and 2.58½c. for 8-lb. and 10-lb. sections. This company is also quoting standard sections 50 lb. and heavier at $45 for Bessemer and $47 for open hearth stock. The Cambria Steel Co. is quoting 25-lb. to 45-lb. sections at 3.75c., 16-lb. and 20-lb. sections, 3.79½c., and 12-lb., 3.84c. at mill, for such delivery as it can make.

Wire Rods.—The demand is very active, but local rod mills are turning down most of the business offered, needing a good part of their output of rods for their own wire mills. We note a sale of 300 tons and two sales of 500 tons each, of soft Bessemer rods at $75, at mill. We quote soft Bessemer and open-hearth rods at $75, screw stock rods $80 to $85, and high carbon rods $85 to $100 at mill.

Wire and Wire Nails.—Local makers are selling only to regular customers and for such deliveries as they can make, which are very uncertain, largely on account of the railroad strike. The American Steel & Wire Co. is still quoting wire nails at $3.25, base, and plain wire at $3, base. Independent mills are quoting $4, base, on wire nails, extras as per the new card, and plain wire for manufacturing purposes at $3.50, base, per 100 lb., the demand for which is very active. Cement coated nails are held at $3.60, base. Prices on wire products are given in detail on page 1554.

We quote wire nails at $3.25 base, this being the price of the American Steel & Wire Co., and $4 base on the new card recently issued by four or five of the independent mills. We quote bright basic wire at $3, this being the price of the American Steel & Wire Co., and $3.50, this being the price of most of the independent mills.

Iron and Steel Bars.—There has been a very heavy falling off in output of both iron and steel bars, due to the railroad strike, several large steel bars mills being down entirely and others operating at only 50 per cent. The implement trade is pretty well covered on steel bars for this year, one leading mill reporting that it covered its agricultural implement customers at about 2.90c., at mill.

We quote steel bars rolled from billets at 2.35c., this being the price of the Carnegie Steel Co. for very indefinite delivery, likely not before first quarter of next year. Other mills rolling steel bars from billets quote from 3c. to 3.50c. at mill, prices depending entirely on the buyer and the delivery wanted. The demand for concrete reinforcing steel bars is fairly active, and we quote these, when rolled from billets, at 4c. to 4.25c., and from old steel rails at about 3.50c. at mill. We quote common iron bars at 4.25c. to 4.50c. and refined iron bars at 4.50c. to 5c. in carloads, f.o.b. mill, Pittsburgh.

Cold-Rolled Steel Bars.—Carload shipments of cold-rolled steel bars are now being accepted by the railroads to some points of delivery that have been embargoed since the railroad strike started, notably Cleveland and Detroit. The demand from the automobile trade is very heavy, and truck delivery is still being made from mills in this district to Toledo, Detroit and other places. We quote cold-rolled steel bars at $4.10 to $4 25 per 100 lb., to regular customers only, f.o.b. at mill, and for such delivery as the mills can make. Premium prices range from 5c. to 7c. at mill, for small lots.

Hot-Rolled Strip Steel.—Three of the leading makers in this district are holding hot-rolled strips at 5½c. per lb., at mill, to regular customers only, and are making most of their deliveries by truck. Premium prices range from 7c. to 9c., at mill, for small lots.

Cold-Rolled Strip Steel.—The leading producers in this district are adhering firmly to the price of 8½c. per lb., at mill, to regular customers only, and for such deliveries as they can make, mostly by truck. Premium prices of 10c. or higher are being offered for small lots for prompt delivery.

Nuts, Bolts and Rivets.—Two local makers report they have not made any change for several months in their discounts on nuts and bolts, and are filling orders of regular customers as best they can at these discounts. Delivery by truck is still being made to nearby consumers. Local makers are sold up for three or four months, but are getting very little steel and making very few shipments. Prices to regular customers on rivets and discounts on nuts and bolts in carloads and larger lots are given on page 1554.

Spikes.—Very few orders are being placed by the railroads for spikes, and these are mostly for small lots, ranging from 200 to about 500 kegs.

We quote standard spikes, ½ to 9/16 in. and larger, $4 base per 100 lb. in carload lots of 200 kegs of 200 lb. each, and small spikes, ⅜ in. and 7/16 in., $4.50; 5/16 in., $5; boat and barge spikes, $4.25 f.o.b. Pittsburgh. Tie plates, $3 to $4 per 100 lb.

Hoops and Bands.—The Carnegie Steel Co. is still quoting the March 21 price of 3.05c. on hoops and bands and another local maker is quoting 5½c. at mill on both hoops and bands, and stated it can readily sell all it cares to at that price.

Iron and Steel Pipe.—The report that the Reading Iron Co. had withdrawn its card of discounts of Jan. 17 last, on iron pipe is incorrect. It is stated that this concern has no intention at present of advancing its prices. The Labelle Iron Works, Steubenville, Ohio, has made an advance on oil country goods. The demand for merchant pipe, also for all steel tubular goods, is still very active, but is not as insistent as early in the year. The National Tube Co. is operating all of its plants and its present output is the heaviest in the history of the company, and so far this month its shipments have been 80 per cent or better of the output. The pipe mills in the Youngstown and Wheeling districts are still doing very little on account of the railroad strike. The discounts for iron and steel pipe are given on page 1554.

Coke.—Railroads are making better deliveries on coke, and several furnaces in the Valley and in this district have started up. The demand for spot furnace coke is very active and consumers are bidding against each other to get it, with the result that prices have advanced in the past week fully $2 per ton. Standard Connellsville coke for eastern delivery has sold at $16 per net ton at ovens and for delivery in the Pittsburgh district or Valley district has sold readily at $14 to $15 per net ton at oven. Sales of close to 200 cars are reported at the latter price. Output of coke in the upper and lower Connellsville regions last week was only 154,400 tons, the lowest in any one week so far this year. We now quote standard grades of blast furnace coke for prompt delivery at $14 to $15 and 72-hr. foundry coke at $15 to $16 per net ton at oven.

Old Material.—Consumers would readily pay $25 per gross ton for selected heavy melting scrap, but dealers say they cannot obtain it and sell it at that price and make a profit. Embargoes that have been on since the railroad strike started at several scrap consuming points have been lifted and local dealers report shipments in the past week as better than at any time during the strike. We note a sale of 500 tons selected heavy steel melting scrap to a Valley consumer at $25 per gross ton delivered. The demand on borings and turnings is not very active and prices are weak.

We quote for delivery to consumers' mills in the Pittsburgh and other districts that take Pittsburgh freight rates, as follows:

Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$25.00 to $25.50
No. 1 cast for steel plants	34.00 to 35.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Franklin, Pa., and Pittsburgh	32.00 to 33.00
Compressed steel	22.00 to 22.50
Bundled, sheet sides and ends, f.o.b. consumers' mills Pittsburgh dist.	16.00 to 16.50
Bundled, sheet stamping	15.00 to 15.50
No. 1 busheling	17.50 to 18.00
Railroad grate bars	26.00 to 26.50
Low phos. melting stock (bloom and billet ends, heavy plates) ⅛ in. and heavier	30.00 to 30.50
Railroad malleable	30.00 to 30.50
Iron car axles	37.00 to 38.00
Locomotive axles, steel	34.00 to 35.00
Steel car axles	31.00 to 32.00
Cast iron wheels	40.00 to 41.00
Rolled steel wheels	29.00 to 30.00
Machine-shop turnings	15.00 to 15.50
Sheet bar crop ends (at origin)	28.00 to 28.50
Heavy steel axle turnings	20.00 to 21.00
Heavy breakable cast	32.00 to 32.50
Cast iron borings	17.00 to 17.50
No. 1 railroad wrought	31.00 to 32.00

Chicago

CHICAGO, May 25.

In some respects the transportation situation has improved while in others it is worse. On the whole, conditions are about the same as a week ago, fuel being the first consideration of mill and melter. Supplies of both coke and coal are exceedingly low, most industries being on a hand-to-mouth basis. One large steel interest, in fact, is employing its entire sale force tracing coal shipments en route. Spot bituminous coal is commanding as high as $7 and $7.50 per ton at mines, while prompt foundry coke is bringing $15 and $16, Connellsville. The seriousness of the situation is being recognized by both the Interstate Commerce Commission and the railroads. The action of the former in reviving war-time methods of routing and handling traffic has not yet affected freight service materially, but is regarded as a step in the right direction. Some relief is also expected to result from the district committees composed of railroad men, shippers and representatives of the Interstate Commerce Commission which are now being organized throughout the country. These bodies will exercise all means possible to dispose of the freight congestion and facilitate movement in and through the large railroad centers.

Even a settlement of the wage question would afford only temporary relief, it is felt, because the shortage of freight cars would continue to restrict business operations. While the action of the Interstate Commerce Commission in setting aside a part of the so-called revolving fund for rolling stock purchases is generally commended, the amount of money involved is not large enough to add materially to existing freight equipment. Believing that the re-establishment of railroad credit is the crux of the problem, manufacturers of Indiana Harbor, East Chicago and Hammond, at a meeting on May 20, telegraphed the Interstate Commerce Commission unanimously endorsing such increases in freight rates as will guarantee a fair return on a liberal valuation of properties and will enable the roads to procure and place in service as soon as possible sufficient equipment to insure adequate and dependable service.

The leading interest was forced to bank one blast furnace each at Gary and South Chicago on May 21, thereby reducing its operations to about 70 per cent of capacity. This company now has an accumulation of 40,000 tons of steel in its yards waiting for cars. The foremost independent continues to operate at 75 per cent of normal and other mills and furnaces are running at about the same rate as a week ago. The most notable improvement has occurred in the western plants of the American Steel & Wire Co., which are again operating at close to normal.

Generally speaking, the market is slow and here and there the tight credit situation has resulted in cancellations. The main limiting factor on buying, however, seems to be the shortage of fuel.

Pig Iron.—Because of limited and uncertain operations, melters are buying sparingly. The key to the situation is the shortage of coke, although in some instances the curtailment of credit and the shortage of other materials required have been factors. Iron is moving more freely than heretofore, the shipments of the leading merchant producers being equal to production. There is still a fair demand for spot material, however, southern foundry being sold at from $42 to $44, base, Birmingham. A 100-ton lot of prompt malleable brought $46.25, Valley Furnace. Inquiry for second half is light, the largest purchase for that delivery being 1200 tons of foundry bought by a Wisconsin melter. Part of this tonnage was bought from an Ohio furnace and the remainder from a southern producer at $42, base, Birmingham. Other recent orders have ranged from 100 to 300 tons. A Michigan foundry is in the market for 500 tons of foundry iron for second half shipment. What is believed to be the first inquiry for 1921 delivery, an inquiry involving 600 tons of foundry, is now before the trade. Local jobbing foundries, recently closed by a strike, are resuming operations, the molders having abandoned their demands and decided to accept the proposal of the employers to pay $1.05 an hour for a day of eight hours.

The following quotations are for iron delivered at consumers' yards except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace and do not include a switching charge averaging 50c. per ton.

Lake Superior charcoal, averaging sil. 1.50 (other grades subject to usual differentials), deliv. at Chicago...	$57.50
Northern coke, No. 1, sil. 2.25 to 2.75.	45.25
Northern coke foundry, No. 2, sil. 1.75 to 2.25.....	43.00
Northern high phos. foundry.....	43.00
Southern coke, No. 1 foundry and No. 1 soft, sil. 2.75 to 3.25.....	50.20
Southern coke, No. 2 foundry, sil. 2.25 to 2.75.....	48.70
Southern foundry, sil. 1.75 to 2.25..	47.00
Malleable, not over 2.25 sil.....	43.50
Basic	42.00
Low phos. (copper free).....	54.00
Silvery, 7 per cent.....$56.40 to	59.80

Ferroalloys.—The leading producer of merchant iron has commenced the production of ferromanganese in the furnace formerly leased to the Miami Metals Co. Up to date it has done little spot business, as receipts of ore did not justify such action. Ample ore is now on hand, however, and bookings for both prompt and last half shipment will be in order. For spot shipment, $250 is asked, whereas the quotation for the entire last half is $200, delivered, and for any part of last half, $225. There is little activity in any of the ferroalloys, the only sales being a few cars of spot ferromanganese at from $235 to $250.

We quote 75 to 80 per cent ferromanganese, last half, delivered, $200; spot, delivered, $235 to $250; 50 per cent ferrosilicon at $85 delivered; spiegeleisen, 18 to 22 per cent, $70 furnace.

Plates.—The construction and repair of railroad equipment constitutes the principal source of new business in plates, although a fair volume of orders emanates from miscellaneous sources such as manufacturers of small oil storage tanks, boilers, and oil barrels, not to mention jobbers. The demand is not so brisk as some months ago, but in the aggregate represents a substantial tonnage. Prompt shipments are still being disposed of at 4c., Pittsburgh, but orders for later delivery, particularly those involving railroad work, are being closed at lower prices. The leading interest, of course, continues to book business at the so-called industrial board prices of March 21, 1919. It is said that one or two independents have closely approximated these prices in connection with car orders. The foremost interest will furnish 6000 tons of plates, shapes and bars for 1500 freight cars to be repaired by the Illinois Car & Equipment Co. for the Illinois Central. The leading local independent will supply 4000 tons for 1000 cars to be repaired for the same railroad by the Bettendorf Co. The Southern Pacific, which was announced to have undertaken the construction of 2000 cars in its own shops, has enlarged its program to 2500 cars, for which the foremost interest will supply 10,000 tons of steel. To a Pacific Coast shipyard the same mill will furnish 3500 tons, this constituting an addition to a previous order for 27,000 tons. The Baltimore & Ohio is inquiring for 800 underframes, which will require 3600 tons of plates, shapes and bars. The National Railways of Mexico are in the market for 500 freight cars involving 2500 tons. The 55 passenger service cars inquired for by the Illinois Central will require 950 tons.

The mill quotation is 2.65c. to 4c., Pittsburgh, the freight to Chicago being 27c. per 100 lb. Jobbers quote 4.17c. for plates out of stock.

Structural Material.—Owing to the decline in building construction, shapes are the dullest of steel products. Yet the volume of business coming in from miscellaneous sources is fair, in fact, surprisingly large under the circumstances. A large Eastern independent continues to offer prompt tonnage at 4c., Pittsburgh, while the leading local independent is booking third quarter tonnage in plain material at 3.52c., mill. High labor costs have discouraged local construction to such an extent that one-half of the building trades workers, it is said, are without employment. Despite the sharp falling off in fabricating projects, two good-sized jobs were let during the week just closed, both going to the American Bridge Co. One of them, a highway bridge at Bismarck, N. D., involves 2425 tons and the other,

a bridge to be erected by the Alaskan Engineering Commission, calls for 1500 tons. Among the few new projects which have developed, 10 highway bridges to be constructed by the Texas State Highway Commission will require 240 tons. A filtration plant for the city of Pontiac, Mich., which fabricators estimated would require 448 tons, will be constructed of reinforced concrete. Smaller fabricating awards include:

Granada Theatre Building, San Francisco, 850 tons, to Central Iron Works.

Missouri, Kansas & Texas Railroad, turntables, Hannibal, Mo., 158 tons, to American Bridge Co.

Kohler Co., Kohler, Wis., gray iron foundry extension, 125 tons, to Milwaukee Bridge Co.

The mill quotation is 2.45c. to 4c., Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote 3.97c. for materials out of warehouse.

Bars.—The demand for mild steel bars is strong, and in some instances Eastern independents are booking business for delivery within six weeks to three months at as high as 4c. and 4½c., Pittsburgh. At the same time, quotations of 3c. and 3½c. are being made on more extended deliveries. Bar iron and rail carbon steel bar mills are restricting their new commitments largely to their regular trade. Bookings have been disproportionately heavy in the light sections and for this reason one bar iron mill continues to charge 0.25c. extra on those sizes. The demand for rail carbon bars is practically country wide, an order for 250 tons for Pennsylvania delivery having been taken by a local mill.

Mill prices are: Mild steel bars, 2.35c. to 4c., Pittsburgh, taking a freight of 27c. per 100 lb.; common bar iron, 3.75c., Chicago; rail carbon, 3.75c., mill.

Jobbers quote 3.87c. for steel bars out of warehouse. The warehouse quotation on cold rolled steel bars is 5.80c. for rounds and 6.30c. for flats and squares, an extra of 15c. per 100 lb. applying to orders exceeding 1000 lb. and under 2000 lb. and an extra of 35c. for orders up to 1000 lb.

Sheets.—The leading local independent has booked business for third quarter only, but operating prospects make an overlap into fourth quarter probable. An Eastern mill is making third quarter allotments in galvanized at 7.75c., Pittsburgh, and in black at 6.50c.

Mill quotations are 4.35c. to 6.50c. for No. 28 black; 3.55c. to 6c. for No. 10 blue annealed, and 5.75c. to 8.50c. for No. 28 galvanized, these all being Pittsburgh prices, subject to a freight of 27c. per 100 lb. to Chicago. The lowest prices are those of March 21.

Jobbers quote, Chicago delivery out of stock, No. 10 blue annealed, 7.02c.; No. 28 black, 8c.; No. 28 galvanized, 9.50c.

Wire Products.—The Western plants of the leading interest are again producing at a normal rate and are taking business from regular customers on a replacement basis. While the demand is keen, there is less disposition on the part of buyers to pay premiums. One of the larger independents is now in a position to take on a restricted tonnage of wire rods at $80, Pittsburgh. For mill prices, see finished iron and steel, f.o.b. Pittsburgh, page 1554.

Rails and Track Supplies.—The demand for standard section rails and track supplies has fallen off somewhat, but inquiry for light rails is brisk, much of it resulting in orders.

Standard Bessemer rails, $45 to $55; open hearth, rails, $47 to $57. Light rails, 2.45c. to 3.50c. f.o.b. makers' mills. Standard railroad spikes, 3.55c. to 4c., Pittsburgh. Track bolts with square nuts, 4.90c. to 5c., Pittsburgh. Steel tie plates and steel angle bars, 2.75c., Pittsburgh and Chicago; tie plates, iron, 3.75c. f.o.b. makers' mills.

Cast Iron Pipe.—Akron, Ohio, will take bids on 1800 tons on June 1. With the exception of this inquiry, the market is without features. Though quiet, pipe is strong and with an advance in freight rates probable, sellers look for even higher prices.

We quote per net ton f.o.b. Chicago, ex-war tax, as follows: Water pipe, 4-in., $79.80; 6-in. and above, $76.80; class A and gas pipe, $2 extra.

Bolts and Nuts.—Five or six manufacturers serving this district have advanced prices. Their new quotations include the following: Rolled thread carriage bolts, 30 and 10 off; cut threads, 30 off; larger, 25 off. Small machine bolts, rolled threads, 40 and 5 off; cut threads, 30 and 10 off; larger, 30 off. Lag screws, 50 off. Nut prices vary, but the minimum quotation on tapped nuts is 1c. off and on blank 1½c. off. The demand continues heavy with operation unsatisfactory because of a shortage of small stock. Iron is being substituted for steel in many cases, but this is not practical in the smaller sizes. A few large cancellations have been received recently, but these are explained on the ground that implement manufacturers whose production is seasonal in character failed to secure delivery in other materials. For mill prices, see finished iron and steel, f.o.b. Pittsburgh, page 1554.

Jobbers quote structural rivets, 5.37c.; boiler rivets, 5.47c.; machine bolts up to ⅝ x 4 in., 30 per cent off; larger sizes 20 off; carriage bolts up to ⅝ x 6 in., 20 off; larger sizes, 15 off; hot pressed nuts, square tapped and hexagon tapped, 50c. off; coach or lag screws, gimlet points, square heads, 40 per cent off. Quantity extras are unchanged.

Old Material.—Last week a large consumer bought 1700 tons of No. 1 busheling at $18.50 per net ton and a tonnage of machine shop turnings at $10. Since that time the market has been practically without activity, the tendency in most prices being downward. Railroad offerings include 3500 tons advertised by the Burlington, 2500 tons by the Rock Island, and 300 tons by the Grand Trunk.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

	Per Gross Ton	
Iron rails	$34.00 to	$35.00
Relaying rails	45.00 to	55.00
Car wheels	37.00 to	38.00
Steel rails, rerolling	31.50 to	32.00
Steel rails, less than 3 ft.	27.50 to	28.00
Heavy melting steel	22.50 to	23.00
Frogs, switches and guards, cut apart	22.50 to	23.00
Shoveling steel	22.00 to	22.50
Low phos. heavy melting steel	28.00 to	28.50
Drop forge flashings	17.50 to	18.50
	Per Net Ton	
Iron angles and splice bars	$30.50 to	$31.50
Steel angle bars	23.00 to	23.50
Iron arch bars and transoms	31.50 to	32.50
Iron car axles	39.00 to	40.00
Steel car axles	32.50 to	33.50
No. 1 busheling	18.00 to	19.00
No. 2 busheling	12.50 to	13.00
Cut forge	23.00 to	23.50
Pipes and flues	15.50 to	16.00
No. 1 railroad wrought	25.50 to	26.00
No. 2 railroad wrought	23.00 to	23.50
Steel knuckles and couplers	22.50 to	23.00
Coil springs	24.00 to	24.50
No. 1 cast	36.50 to	37.50
Boiler punchings	24.00 to	24.50
Locomotive tires, smooth	23.00 to	23.50
Machine shop turnings	9.50 to	10.00
Cast borings	11.50 to	12.00
Stove plate	29.00 to	29.50
Grate bars	29.00 to	29.50
Brake shoes	25.50 to	26.00
Railroad malleable	25.75 to	26.25
Agricultural malleable	25.75 to	26.25
Country mixed	16.00 to	17.00

Buffalo

BUFFALO, May 24.

Pig Iron.—The situation is quiescent. The car shortage has thrown the trade into a state of inactivity. It is practically impossible to obtain cars and such as are received are not in good shape. All furnaces are piling iron and inquiry has been checked because consumers do not know when they can obtain delivery on iron already bought. So far as can be learned, not more than 500 tons, all foundry, was sold during the past week. This was for second half delivery. Three of the four furnaces are not quoting, and the fourth is extremely cautious about acquiring tonnage. This furnace has a little iron left for last half delivery, but being unable to ship on present commitment, is not pushing for business to take up this slack. There are no indications yet of quoting for first half of 1921, no furnace interest having the hardihood to predict what operating conditions will be for the rest of the year.

We quote f.o.b. Buffalo:

No. 1 foundry, 2.75 to 3.25 sil.	$48.00
No. 2 X foundry, 2.25 to 2.75 sil.	46.25
No. 2 plain, 1.75 to 2.25 sil.	45.00
Basic	$44.00 to 45.00
Malleable	46.25
Lake Superior charcoal	58.00 to 60.00

Finished Iron and Steel.—There is very little change in the elements of this week's market over last. Mills are awaiting the result of the operation and general direction of cars by the Interstate Commerce Commission, which has the authority under the Cummins-Esch bill to take charge of routing of all shipments and is now assuming that direction. It is recognized that

iron and steel may have to give place to perishable goods under the new regime, and mills are holding off to determine just how far they can go. The general wave of pessimism which seems to have struck the other markets has not affected iron and steel. There has been a checking of demand, but this is no doubt due to the inability of the customer to gage with any degree of certainty the time of delivery on goods already purchased. The underlying market is strong. Railroad rolling stock has deteriorated considerably, and it is realized that this must soon be replaced. At a convention of the Natural Gas Association of America in Buffalo last week, it was stated authoritatively that the demand for tubular products for oil and gas development will keep the mills of this country busy for five years. European railroad rolling stock has also been unprecedentedly run down and it is predicted that American steel will be going to Europe for the next 10 years to replace deterioration. The demand for wire products is very insistent. Nails are very scarce. There is also a pressing demand for tinplate, for bars of small sizes and for cold finished steel. Some of the higher premium mills have allowed their prices to recede slightly, but the prices of the leading interest and of the independent conservatives remain about the same.

Jobbers quote the following prices for this territory: Steel bars, 4.61c.; iron bars, 5.26c.; structurals, 4.46c.; plates, 4.66c.; No. 10 blue annealed sheets, 6.51c.; No. 28 black sheets, 8.25c.; No. 28 galvanized sheets, 9.50c.; bands, 5.81c.; hoops, 6.06c.; cold rolled steel, 6.00c.

Old Material.—There is a more encouraging note to the market this week than for some time. Shipments are being routed through more freely and there is considerably more material moving than last week, though there are still many embargoes in effect. There is a picking up of demand, notably from Canada north of the Upper Michigan district. Heavy melting steel is being sought at $26 Buffalo for shipment to these points. In addition to this price the consuming mill must pay duty and freight. A Buffalo district mill is still in the market for what steel it can get and will pay $24.50. Dealers look for a strong market when transportation difficulties can be adjusted. They state that stocks of mills are very low at this time. We quote dealers' asking prices per gross ton f.o.b Buffalo.

Heavy melting steel, regular grades	$24.50 to $25.50
Low phos., 0.04 and under	31.50 to 32.50
No. 1 railroad wrought	30.50 to 31.50
No. 1 machinery cast	37.50 to 38.50
Iron axles	39.00
Steel axles	39.00
Car wheels	37.00 to 38.00
Railroad malleable	30.50 to 31.50
Machine-shop turnings	16.00 to 16.50
Heavy axle turnings	19.50 to 20.50
Clean cast borings	16.50 to 17.50
Iron rail	29.50 to 30.50
Locomotive grate bars	23.50 to 24.50
Stove plate	31.50 to 32.50
Wrought pipe	20.50 to 21.50
No. 1 bushgling	19.50 to 20.50
Bundled sheet stamping	16.50 to 17.50

Birmingham

BIRMINGHAM, May 24.

Pig Iron.—The larger makers of pig iron are selling with practical uniformity on a $42 base. The smaller concerns continue to book orders at $43 and, in some instances, at $44 for spot and early delivery. The $42 base applies both to foreign and domestic business. Two lots of iron for Italy were booked during the week. Each was 1500 tons and for early delivery. Two different makers shared the business. A shipment of 500 tons of iron for Italy is now moving out of New Orleans. Several lots were also booked for New England delivery. They will move via Savannah in order to avoid the car congestion and benefit by the rate. One New England lot was for 1000 tons and another for 1500. A lot of 1500 tons was taken by a strictly southern consumer. One concern, which is operating two blast furnaces, booked a total of 6000 tons. This was well scattered through the Middle West and South, portions going to the extreme West and some for export to Italy. Furnace operators are not inclined to boom the market, but seem to prefer to nurse the present basis. The raw material situation must have improved. The Tennessee company blew in a stack at Bessemer on foundry on May 20 and will blow in a stack of Ensley during this week on basic. This will give it two stacks on foundry and seven on basic, the largest number it has had active in a long period. The Sloss-Sheffield Steel & Iron Co. does not expect to blow in its sixth stack at North Birmingham until some time in July, but will have it counting for last half production. The Gulf States Steel Co. is also nearing completion of repair work on its stack at Gadsden. This concern is now in splendid form for raw material, having, after six years of hard work, completed the drilling of its self-fluxing ore slope at Shannon mines. The slope is 2611 feet deep and contains self-fluxing ore of more than 38 per cent metallic iron. The eventual output is expected to be 2000 tons daily, which will serve to operate four furnaces. The Gulf States Steel Co. has but one; so the overplus will be available for other iron makers.

We quote per gross ton, f. o. b. Birmingham district furnaces, the Tennessee company excepted, as follows:

Foundry, sil. 1.75 to 2.25	$42.00 to $44.00
Basic	41.00 to 43.00
Charcoal	55.00

Cast Iron Pipe.—Southern municipalities, especially those of the Carolinas, send in a continuous string of orders for water pipe. LaFayette, N. C., has taken 300 to 400 tons. Dothan, Ala., has taken 12,000 feet of 6-in. pipe and Albany, Ga., has ordered a considerable quantity of small pipe. Gadsden, Ala., is in the market for 5000 ft. of 6 to 10-in. Sanitary shops were never busier. The Eastham and Emory at Anniston, two new shops, should come in shortly. Prices remain at $73 for 4-in. and $70 for 6-in. and upwards.

Coal and Coke.—The coke situation is acute. A Chattanooga interest vainly tried to place 6000 tons in Birmingham. St. Louis is taking some by-product coke. The Alabama By-Products Co. is shipping spot coke over a wide territory. Prices for handpicked foundry remain at $11 to $12.50.

Old Material.—The scrap market has shown no signs of reviving interest. The heavy steel consumers still hold off. Cast is active.

We quote per gross ton, f. o. b. Birmingham district yards prices to consumers, as follows:

Steel rails	$21.00 to $22.00
No. 1 steel	19.00 to 20.00
Cast iron borings	14.00 to 15.00
Machine shop turnings	14.00 to 15.00
No. 1 cast	34.00 to 35.00
Car wheels	32.00 to 33.00
Tramcar wheels	31.00 to 32.00
Steel axles	29.00 to 30.00
No. 1 wrought	26.00 to 27.00

New York

NEW YORK, May 25.

Pig Iron.—Although reports are somewhat conflicting owing to different experiences of shippers, the prevailing opinion is that transportation conditions are improving. When it becomes known that a railroad is getting in fairly good condition, there is a rush of shippers to it and it becomes necessary frequently to declare a temporary embargo. For this reason the impression prevails in some quarters that conditions are not as good as they were, but a larger tonnage undoubtedly is moving. For example, a trainload of 30 cars of pig iron was moved from Virginia to New England where the cars were distributed to various consuming points. Conditions are, however, far from satisfactory, and foundries are operating with great difficulty and with reduced forces. Sales for the week include a moderate tonnage for export. Some New York agents are exporting from other ports than New York, as conditions here are not as favorable as in some southern ports. Much difficulty is experienced in obtaining deliveries of coke, and the price of the New England Coal & Coke Co. has advanced to $15, not only for prompt delivery, but on contracts, and contracts made with a clause providing for an advance in case

of the price of coal advancing are being revised. Some of these contracts were made at $9.50.

We quote for delivery in New York as follows:

East. Pa., No. 1 fdy., sil. 2.75 to 3.25	$50.05 to $51.05
East. Pa., No. 2 X fdy., sil. 2.25 to 2.75	49.05 to 50.05
East. Pa., No. 2 fdy., sil. 1.75 to 2.25	47.80 to 48.80
Buffalo, sil. 1.75 to 2.25	47.90 to 48.90
No. 2 X Virginia, sil. 2.25 to 2.75	49.60

Ferroalloys.—The ferromanganese market continues strong but not particularly active. This is partly explained by the fact that the steel output has declined measurably since the railroad strike in April, resulting in a consequent diminution in the consumption of ferromanganese. Prices continue firm at $225 to $250 for delivery this side of July, with $200, delivered, asked for the last half for domestic alloy. At present no British alloy is available for delivery after July, but a limited amount can be had for earlier shipment at $225, seaboard. A Southern producer of electric ferromanganese during the war has recently made plans to again produce the alloy, and it is reported that a small electric plant in the Middle West is also making this material. Rumors last week that two large steel companies would produce the alloy in the near future are now denied. Inquiry for ferromanganese for export is fairly active. The spiegeleisen market continues unchanged at $75, furnace, with demand from domestic consumers moderate but from foreign sources heavy. Present high prices, however, tend to limit transactions in the latter direction. One large American consumer who was inquiring recently for 3000 tons is understood to have closed for this amount. There is almost no business reported in the 50 per cent ferrosilicon market which continues quiet at $80 to $90 per ton, delivered. This quotation is largely nominal, as most producers are sold up to the middle of the year.

Warehouse Business.—Transportation shows a slight improvement, but warehouses in most cases make shipments at considerable expense, often keeping a truck in line for several hours before the material is accepted. A mill recently notified a customer in New York that two cars awaiting delivery would be sent in a solid train to a point in New Jersey, provided he would accept them at this point, otherwise no promise as to delivery could be made. Prices of mills selling from stock are high, in some instances higher than prevailing warehouse prices. Some warehouses report a lessening demand for material now on hand of which there was an acute shortage a few months ago, attributing it to the fact that some consumers have reduced production and eliminated certain lines of manufacture on account of material shortage. The situation in brass and copper is unchanged. We quote prices on page 1578.

Finished Iron and Steel.—Such improvement as there has been in the railroad situation is spotty; on the whole, there is very little change. Here and there are consumers who are getting a slightly better steel supply, but nearly all consuming plants in this district are short of material and hours of work have been curtailed in numerous instances. Despite some anxiety over the general business situation, the belief held by sales representatives of the steel companies is that there will be no marked lowering of prices until the supply of material is somewhere near equal to the demand. Though there are few inquiries, it is stated that this indicates only the feeling among consumers that it is useless to buy when it is so difficult to get shipments. Any marked improvement in transportation, it is believed, will bring many buyers into the market. Meanwhile, prices continue firm, with the exception of those on plates. Tank steel or universal plates can be had at 3.50c. to 3.75c., Pittsburgh, while even on ship steel lower than 4c., Pittsburgh, has been done on sizable transactions for export. Upward of 1000 tons was sold for shipment to Scotland at 3.95c., Pittsburgh, and more than 1000 tons went at 3.85c., Pittsburgh. Bars, sheets and wire products, in particular, continue strong. There is a demand for forging billets, especially for railroad work, and as high as $85, Pittsburgh, has been paid. In structural steel lettings and inquiry there is a decided let-up. A theater at Trenton, N. J., requiring 850 tons, is in the market and the Llewellyn Iron Works has taken a 300-ton fabricating job for the General Chemical Co. Otherwise the market is inactive, but several inquiries, reported last week, are still pending. Inquiry for railroads has fallen off awaiting the outcome of the financing authorized by Congress, which will provide $500,000,000, of which $125,000,000 will come from the Government, the remainder to be raised by the issuance of equipment trust certificates. If the program for 100,000 freight cars goes through, about $300,000,000 will be required to finance the purchase. The remaining $200,000,000 will be available for locomotives, passenger and baggage cars. Locomotive plants are fairly busy, but the construction of 2000 additional locomotives will not be difficult, owing to the large capacity of these shops.

We quote for mill shipment, New York, as follows: Soft steel bars, 2.62c. to 4.52c.; shapes, 2.72c. to 4.27c.; plates, 2.92c. to 4.27c., the minimum prices being for indefinite delivery and the highest prices for delivery in a few weeks; bar iron, flats, wider than 6 in., 4.57c.; ¾ and 7/16 in., round and square, 5.27c.; light rounds, squares and flats, 5.77c., and other sizes, 4.27c.

High Speed Steel.—There is a good demand from large consumers and prices tend to stiffen. Prices are still $1.25 to $1.30 per lb., New York.

Cast Iron Pipe.—There is more activity in the South and West than in this district. However, the volume is satisfactory. The production is about 50 per cent of maximum capacity due to inability to obtain enough workmen and to get full work from those who are employed. Shops have no difficulty in obtaining full prices. We quote 6-in. and heavier at $76.30, New York; 4-in. $79.30, with $2 additional for Class A and gas pipe.

Old Material.—The general price cutting movement is evidently causing consumers to watch to see if scrap will be affected. A prominent user of heavy melting steel in eastern Pennsylvania is receiving one car per week from the source from which it normally receives many. We are marking seven items from 50c. to $1 lower.

Buying prices per gross ton, New York, follow:

Heavy melting steel	$19.50 to $20.00
Rerolling rails	29.00 to 30.00
Relaying rails, nominal	52.00 to 54.00
Steel car axles	38.00 to 39.00
Iron car axles	43.50 to 44.00
No. 1 railroad wrought	31.00 to 32.00
Wrought iron track	22.00 to 22.50
Forge fire	15.50 to 16.00
No. 1 yard wrought, long	23.50 to 24.00
Light iron	9.00 to 10.00
Cast borings (clean)	16.50 to 17.00
Machine-shop turnings	15.00 to 15.50
Mixed borings and turnings	14.50 to 15.00
Iron and steel pipe (1 in. min. diam., not under 2 ft. long)	19.50 to 20.00
Stove plate	27.00 to 27.50
Locomotive grate bars	28.00 to 28.50
Malleable cast (railroad)	29.00 to 30.00
Old car wheels	37.00 to 38.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton:

No. 1 machinery cast	$40.00 to $41.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	39.00 to 40.00
No. 1 heavy cast, not cupola size	32.00 to 33.00
No. 2 cast (radiators, cast boilers, etc.)	31.00 to 32.00

Cincinnati

CINCINNATI, May 24.

Pig Iron.—The market is very quiet, and sales during the week were the smallest for some time past. Inquiry also is light, being mostly for small lots for prompt shipment from melters who have not been receiving shipments on their contracts. Despite the present lull in buying, prices remain firm and Southern furnaces are reported to be very bullish regarding the future. Their attitude is based on the fact that Northern furnaces are reported to be well sold up for last half and that consumers who have not covered for their requirements will have to turn to the South. Other factors entering into this bullish feeling are the high price of coke, extreme probability of an increase in railroad freight rates and possibility that production will not be equal to the demands. Sales aggregating 7000 tons of Southern foundry iron for export are reported by one interest during the week. We also note the sale of 500 tons of Southern foundry iron, silicon 1.75 to 2.25, to an Indiana melter at $42, Birmingham;

also 400 tons of silicon 2.25 to 2.75 in this territory at $43.70, Birmingham. Furnaces in southern Ohio are able to secure a fair supply of coke, and are shipping the greater part of their iron.

Based on freight rates of $3.60 from Birmingham and $1.80 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base price)	$45.60
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	46.85
Ohio silvery, 8 per cent sil.	59.80
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	46.80
Basic Northern	41.80
Malleable	$45.80 to 46 80

Coke.—The coke situation remains about the same, with a few cars being received. Up to this time, foundries have been able to keep running, but are unable to pile up a reserve supply. Connellsville foundry coke is now quoted at $14 to $15. What little New River coke is to be had is held at $15. It is reported that Wise County operators are out of the market, practically all their output for the rest of the year having been contracted for. We note the sale of over 60,000 tons of coke from an Indiana operator to a public utility company in the Middle West at a price said to be $13 a ton, delivery to be made at the rate of 9000 tons a month commencing June 1.

Finished Material.—Some difficulty is being experienced by southern Ohio sheet mills in securing box cars for shipments, and consumers are asking that sheets be forwarded in any cars available. One mill, on an inquiry for 1000 tons of sheets, stated that with the crowded condition of its order books, it was unable to take on more than 25 per cent of the tonnage for the delivery wanted. Buyers are endeavoring to place orders for their last half needs, but it is understood to be the policy of the companies not to book beyond 90 days. There is a big demand for bars and bands, but shapes and plates have slackened off, and one independent mill is now in a position to make almost immediate delivery at prices below those to which they have been adhering for some time. Warehouses report business still brisk, particularly in small rounds and cold-rolled strip steel. Prices, with the exception of plates and shapes, are the same as those prevailing for some weeks. The Louisville & Nashville Railroad has awarded the contract to the McClintic-Marshall Co. for repair work on two bridges at Memphis and Nashville, involving about 100 tons. Bids are also being received for a power house for the Hamilton Furnace Co. involving about 100 tons. It is understood that the addition to the Rollman department store at Cincinnati, which was expected to take about 1000 tons, will be constructed of reinforced concrete.

Jobbers quote: Iron and steel bars, 5c. to 6c.; structural shapes, 5.10c.; plates, 5c.; steel bands, 6.25c. base; No. 10 blue annealed, 7.50c.; No. 28 black sheets, 9c.; No. 28 galvanized sheets, 10c. to 15c.

Old Material.—The scrap market is practically at a standstill, very little trading being done, and then only on a small scale. Dealers are offering scrap to local consumers, where it can be moved by trucks, at prices considerably below those prevailing some weeks ago. The impossibility of securing cars for moving old material is ascribed as the cause of the dullness. It is reported that the Louisville & Nashville Railroad, which recently offered a considerable tonnage of scrap, has withdrawn its list, as the offers received were not considered sufficiently attractive.

Per Gross Ton

Bundled sheets	$16.00 to $17.00
Old iron rails	27.00 to 28.00
Relaying rails, 50 lb. and up	48.00 to 49.00
Rerolling steel rails	29.00 to 30.00
Heavy melting steel	21.50 to 22.50
Steel rails for melting	24.00 to 25.00
Car wheels	29.00 to 30.00

Per Net Ton

No. 1 railroad wrought	$25.00 to $26.00
Cast borings	11.50 to 12.00
Steel turnings	9.50 to 10.00
Railroad cast	31.00 to 32.00
No. 1 machinery	35.00 to 36.00
Burnt scrap	22.00 to 23.00
Iron axles	29.50 to 30.00
Locomotive tires (smooth inside)	23.50 to 24.50
Pipes and flues	17.00 to 17.50
Malleable cast	22.00 to 22.50
Railroad tank and sheet	16.00 to 16.50

Boston

BOSTON, May 25.

Pig Iron.—Efforts by local pig iron houses during the past week have been directed mainly to securing deliveries on iron previously bought by New England melters, who in a number of cases are hard pressed for raw material. There has been, however, considerable Alabama iron in small lots sold for nearby delivery at, generally speaking, $42 furnace base. Some sales have been made slightly above and below that price. The bulk sold was silicon 2.75 to 3.25. Alabama iron can be shipped by water to Boston and from here to interior points in comparatively short time. Bookings the past week have run well into four figures. A few hundred tons eastern Pennsylvania No. 2X iron, carrying a $2.90 freight, second and third quarter delivery, has sold at $46.25 furnace base, or $50.40 delivered. A sale of 400 tons resale malleable, prompt delivery, at approximately $49 delivered, and one of a car of charcoal, prompt delivery, at $70 furnace, are reported. Otherwise business has been largely between those foundries fortunate enough to have iron they could sell or loan to hard pressed melters. One Virginia furnace offering iron at $43.25 base has withdrawn from the market, which now is nominal at $44 to $45 base. Delivered prices follow:

East. Penn., sil. 2.25 to 2.75	$49.15 to $51.15
East. Penn., sil. 1.75 to 2.25	47.90 to 49.90
Cent. & West. Penn., sil. 2.25 to 2.75	49.95 to 50.95
Cent. & West. Penn., sil. 1.75 to 2.25	48.70 to 49.70
Buffalo, sil. 2.25 to 2.75	49.15 to 50.15
Buffalo, sil. 1.75 to 2.25	47.90 to 48.90
Virginia, sil. 2.25 to 2.75	49.95 to 50.95
Virginia, sil. 1.75 to 2.25	48.70 to 49.70
*Alabama, sil. 2.25 to 2.75	49.45
*Alabama, sil. 1.75 to 2.25	47.75

*Alongside Boston prices.

Fluorspar.—A total of 450 tons for this year's delivery is reported sold this week at recently established prices. There are but four concerns in New England that use fluorspar to any extent.

Warehouse Business.—Local warehouse prices on Norway iron and black and galvanized sheets are unchanged, but those on other kinds of steel and iron are higher. Cold rolled steel rounds, squares, hexagons and flats are $2 per cwt. higher, on blue annealed sheets, open hearth and crucible spring steel, rubber tire channel and floor plates $1 higher, on steel bands, hoops, half rounds and toe calk steel and band and hoop iron, 75c higher, while everything else on the list has advanced 50c. Revised prices follow:

Jobbers quote: Soft steel bars, $6 to $6.50 base per 100 lb.; flats, $6.50 to $6.85; concrete bars, $6 to $6.50; tire steel, $7 to $7.50; spring steel, open hearth, $11; crucible, $16; steel bands, $8 to $8.25; steel hoops, $9; toe calk steel, $8; cold rolled steel, $10 to $10.50; structural, $6 to $6.50; plates, $6.50; No. 10 blue annealed sheets, $9; No. 28 black sheets, $9.15; No. 28 galvanized sheets, $10.50; refined iron, $6 to $8 base; best refined, $7.50; Wayne, $8.50; band iron, $8; hoop iron, $9; Norway iron, $20.

Coke.—The New England Coal & Coke Co., has withdrawn from the spot market and has advanced its contract and sliding scale price to $15 Connellsville base, or $19.40 delivered, because it is obliged to go into the open market and purchase coking coals at premiums in order to keep its Everett plant operating. At Everett, 265 out of 400 ovens are functioning. Owing to demurrage charges and constantly advancing coal markets, a further advance in coke price is anticipated. The Massachusetts Gas Co. controls the New England Coal & Coke Co. and owns a substantial interest in coking coal properties, among other things. Some time ago it sold a considerable part of its coking coal mines output for a period of months to the United States Steel Corporation at approximately $10 a ton at the mine. Later the outlaw railroad strike brought about the present inflated coal market. The New England Coal & Coke Co. therefore found itself confronted with the problem of one of two courses to maintain—either suspend operations at Everett, or go into the open market, buy coking coals at prevailing prices and revise its coke market base price. The Providence Gas Co's. coke price is unchanged, but indications are its sliding scale price will advance June 1.

Old Material.—Aside from a decline of about $1 in wrought pipe and stove plate, local quotations on old material are virtually the same as reported last week. The best price offered for wrought pipe is $19.50, but holders are reluctant to sell at that figure. Stove plate owners, likewise, are inclined to consider $27 to $28 too low to be attractive and are holding. Dealers are in the market for street car axles and car wheels, but almost nothing is offered. Otherwise the scrap market is quiet and uninteresting, more so, in fact, than it was last week. Dealers are giving more attention to moving scrap already purchased than to new business. The railroad transportation is better than it was last week, but remains far below normal. Local yard prices follow:

No. 1 heavy melting steel	$18.00 to $19.50
No. 1 railroad wrought	27.00 to 28.00
No. 1 yard wrought	24.00 to 25.00
Wrought pipe (1 in. in diameter, over 2 ft. long)	19.00 to 19.50
Machine-shop turnings	14.00 to 15.00
Cast iron borings	15.50 to 16.50
Heavy axle turnings	16.00 to 17.00
Blast furnace borings and turnings	14.00 to 15.00
Forged scrap	14.50 to 15.50
Bundled skeleton	14.50 to 15.50
Street car axles	31.00 to 33.00
Car wheels	37.00 to 38.00
Machinery cast	38.00 to 40.00
No. 2 cast	35.00 to 36.00
Stove plate	27.00 to 28.00
Railroad malleable	26.50 to 27.50
Rerolling rails	27.50 to 28.50

Philadelphia

PHILADELPHIA, May 25.

Though reports from Washington indicate that the freight congestion throughout the country is breaking up, the improvement in the East is scarcely discernible. It is somewhat easier to obtain shipping permits, but in the aggregate the amount of pig iron, steel, etc., being shipped forms a small part of that which is available for shipment. Arrivals of coal, coke and other raw materials are not increasing rapidly enough to bring about any important increase in steel or iron production. Operations are at a slightly better rate than two or three weeks ago, but no early return to normal production is looked for until the railroads have fully overcome their handicaps, which may not be for two or three months.

Fully realizing now the seriousness of the railroad situation, the steel and iron trade does not look for an active market for a few months, at least, but anticipates no protracted depression, such as is hinted at in other fields of industry.

With the exception of weakness in scrap and slight lowering of premium prices on plates and shapes, the entire list of quotations presents a firm tone.

Pig Iron.—The market continues quiet but firm. In foundry grades there is a fair demand for carload lots for prompt shipment to relieve shortages caused by the shipping situation, but the aggregate of iron being sold is not large. In steel making grades practically nothing is being done except a few sales of copper bearing low phosphorus iron at $47, furnace. The last reported sales of copper-free iron were made at $52, furnace. There is no demand for basic, but quotations are generally $43 to $44, furnace. Gray forge is quoted at about the same range. The minimum for foundry iron is $45 base, furnace, this applying to the grade containing 1.75 to 2.25 per cent silicon. Production of merchant iron is being cut down in the East through inability of the furnaces to obtain sufficient coke. At the same time, consumption of iron is reduced, so that decreased production is probably offset by decreased melt. A train of 50 cars of foundry iron has been shipped to New England by an eastern furnace.

The following quotations are for iron delivered in consumers' yards in Philadelphia or vicinity, except those for low phosphorus iron, which are f.o.b. furnace:

East. Pa., No. 2 X, 2.25 to 2.75 sil.	$47.15 to $49.35
East. Pa., No. 2 plain, 1.75 to 2.25 sil.	45.90 to 48.10
Virginia No. 2 plain, 1.75 to 2.25 sil.	49.10
Virginia No. 2 X, 2.25 to 2.75 sil.	50.35
Basic deliv. eastern Pa.	44.80
Gray forge	43.00 to 44.00
Standard low phos. (f.o.b. furnace)	52.00
Malleable	46.75
Copper bearing low phos. (f.o.b. furnace)	47.00

Coke.—Very little coke is obtainable for prompt shipment, but such sales as were made during the week were at high prices, $15 to $16 for both furnace and foundry grades.

Ferroalloys.—A few sales of 70 per cent ferromanganese for spot shipment have been made at $225, delivered. The 78 to 80 per cent grade for May-June is quoted at about $240, while $200 is still the quotation for last half. A western steel plant has bought British alloy for last half at $195, seaboard. An eastern steel company, which came into the market for 3000 to 5000 tons of spiegeleisen for last half, has decided not to buy for the present.

Semi-Finished Steel.—There is a good demand for semi-finished steel, and high prices have been paid to insure early delivery. Though one eastern company is supplying open-hearth rerolling billets to its regular customers at $60, Pittsburgh, other companies are getting $65 to $70, Pittsburgh. A sale of 1000 tons of rerolling slabs has been made by an eastern steel company at $70, Pittsburgh. A sale of 2000 tons of forging billets, subject to special inspection and tests, has been made at $85, Pittsburgh. Other companies have also sold forging billets at $80 and $85. One company will soon have sheet bars to sell, and will probably quote $80 to $90, Pittsburgh. The Newcastle plant of the Penn Seaboard Steel Corporation has converted its plate mill to a blooming mill and will begin blooming operations on June 1. Its output of billets, 4 x 4 in. and larger, will be 6000 tons a month, of which about one-half will be available for sale.

Plates.—The plate market is weaker, and, with the exception of structural shapes, it is the one spot in the steel market where there has been any lowering of prices by the mills. This applies, of course, to the independent mills, as the leading interest continues to quote plates at 2.65c., Pittsburgh, but cannot make early deliveries. Mills that were strictly adhering to 4c., Pittsburgh, on all grades a few weeks ago, are willing to accept orders for tank steel or universal plates at 3.50c. to 3.75c., Pittsburgh, while ship steel has been sold at from 3.75c. to 3.85c., Pittsburgh, for export. Small lots, 100 tons or less, have been sold during the week, however, at 4c. The willingness of mills to take plate business at lower prices is ascribed to the railroad situation, as rolling schedules have been demoralized by the inability of mills to ship to all points. The demand for plates is chiefly from abroad. Great Britain is a fairly large buyer of ship steel, and a sale of 4000 tons to Denmark was a feature of the week. On 2000 tons of ship plates for England, an eastern mill quoted 3.75c., Pittsburgh, and got the business, while something over 1000 tons went at 3.85c., Pittsburgh. Locomotives continue to take the lead in the domestic business placed. Output is still considerably below normal owing to lack of coal.

Structural Material.—There is a softening of prices for shapes. One or two eastern mills that a few weeks ago were quoting 3.75c. are now willing to take orders for early delivery at 3.25c., Pittsburgh. The range of quotations is 3.25c. to 3.75c., Pittsburgh, by eastern mills. One company which quotes 4c. is taking very little business at this price. The building market is quiet.

Bars.—The demand for steel bars is still active. One company is taking considerable business at 4c., base, Pittsburgh. Automobile manufacturers are buyers and delivery is more important to them than price. Band steel is also in demand, 1000 tons having been sold to one consumer at 6c., Pittsburgh. Spring steel has sold at 4.50c., Pittsburgh, plus a 25c. extra, 500 tons going to one consumer at this price. We also note the sale of 1000 tons of reinforcing bars at 4c., Pittsburgh. There is a fairly good demand for bar iron, the price still being 4c., base, Pittsburgh.

Sheets.—Eastern makers of sheets are turning down business regularly. One eastern company quotes 5.50c., Pittsburgh, on blue annealed, while another asks 6c.

Rails.—The Lackawanna Steel Co. has taken 850 tons of 70-lb. low-carbon contact rails for the Philadelphia Rapid Transit Co. It is reported that the price was 4.50c., per lb., mill.

Old Material.—The dullness which has characterized the market for several weeks continues. Prices on several grades are lower than a week ago, and some in the trade believe the bottom has not yet been reached. Heavy melting steel has sold at $23, delivered. An eastern iron rolling mill has paid $20.50, delivered, for machine shop turnings, but this is above the regular market, which is quoted at $18.50 to $19. We quote for delivery at consuming points in this territory as follows:

No. 1 heavy melting steel	$23.00 to $23.50
Steel rails rerolling	32.00 to 33.00
No. 1 low phos., heavy 0.04 and under	30.00 to 31.00
Car wheels	40.00 to 41.00
No. 1 railroad wrought	33.00 to 34.00
No. 1 yard wrought	27.00 to 28.50
No. 1 forge fire	18.50 to 19.00
Bundled skeleton	18.50 to 19.00
No. 1 busheling	20.00 to 21.00
No. 2 busheling	17.00 to 18.00
Turnings (short shoveling grade for blast furnace use)	18.00 to 19.00
Mixed borings and turnings (for blast furnace use)	17.50 to 18.00
Machine-shop turnings (for rolling mill and steel works use)	18.50 to 19.00
Heavy axle turnings (or equivalent)	20.00 to 20.50
Cast borings (for rolling mills)	20.00 to 21.00
Cast borings (for chemical plants)	21.50 to 22.50
No. 1 cast	37.00 to 38.00
Railroad grate bars	31.00 to 33.00
Stove plate (for steel plant use)	28.00 to 29.00
Railroad malleable	28.00 to 29.00
Wrought iron and soft steel pipes and tubes (new specifications)	24.00 to 24.50
Iron car axles	45.00 to 46.00
Steel car axles	42.00 to 44.00

Cleveland

CLEVELAND, May 25.

The transportation situation on the whole improved in this territory during the week, but the improvement was somewhat in spots, as conditions show practically no change at some points. Steel is coming from the Pittsburgh district in better volume and mills are not depending so much on trainload shipments to get material through to Ohio points as they were a week ago. With railroads now in a better position to handle material, the scarcity of cars is becoming more pronounced and the problem of a car supply is over shadowing the switchmen's strike. Conditions have improved in Canton, where the United Alloy Steel Corporation is now operating 10 open-hearth furnaces, a gain of six over last week. The supply of common labor continues to grow more plentiful and employers are able to get this labor without paying the abnormally high wages that have prevailed recently.

Iron Ore.—Lake shipments of iron ore are slowly increasing and more boats are going into commission. The Pittsburgh Steamship Co. started many of its freighters this week and before the end of the week expects to have about all its steamers running. No date has been set for starting its barges. However, with a gain in ore shipments boats are being delayed longer at lower Lake ports waiting for cars, these delays in some cases being four or five days. Because of the transportation conditions, the bulk of the ore is still going to Lake front furnaces. A meeting of the ore shippers May 21 resulted in a deadlock over agreeing to a plan to pro rate ore shipments to consumers according to their requirements as was done in 1918. The coal men had previously agreed to pool coal shipments provided the ore men would agree to the pooling plans. The railroads promised their co-operation without actually pooling cars as was done two years ago. However, the Pittsburgh Steamship Co. and several independent shippers refused to agree to the plan. These maintained that as business is now back on a competitive basis, they have no right to agree to any plan to pro rate ore to consumers. The matter has been referred to the Interstate Commerce Commission for a ruling. Pending a decision of the commission, shipments will be handled the same as last year, when no need for pro rating was felt, as the car supply was ample. The ore people say that 30,000 cars that could be used in the ore and coal trade have been diverted to the West, and they feel that these cars should be returned to serve the two basic industries. Ore shippers favoring the pro rate plan contend that it will be impossible to move all the ore that has been sold and some purchases have probably been made in excess of actual needs. They want to get the greatest efficiency possible out of the inadequate car supply and at the same time take care of the actual needs of all the furnaces.

We quote, delivered lower Lake ports: Old range Bessemer, $7.45; old range non-Bessemer, $6.70; Mesaba Bessemer, $7.20; Mesaba non-Bessemer, $6.55.

Pig Iron.—Pig iron continues very dull. Shipments from Cleveland furnaces and from other furnaces operated by local interests show little change as compared with the past week or two, although an improvement is noted in spots. Some furnaces are able to ship all of their iron and others are compelled to pile nearly all of their product. The McKinney Steel Co. blew out one of its Josephine stacks last week because of inability to secure coke, cutting off its shipments of basic iron to two consumers. Many foundries are crowding furnaces for shipments as their stocks are very low. However, Cleveland foundries are being fairly well supplied with iron and some shipments of Alabama and southern Ohio iron are coming into this territory. One interest reports sales during the week of several lots for early shipment of foundry iron aggregating 1000 tons, and contracts for the third quarter aggregating 6000 tons. In the latter are included 2000 tons of malleable iron taken by a northern Ohio foundry. Low phosphorus iron is more active than for some time and prices are firmer. A local interest reports several sales in small lots at $51 for delivery within the next three months and is now quoting as high as $53.

We quote delivered Cleveland, as follows, based on 40c. switching charge for local iron, a $1.40 freight rate from Valley points, and $5 from Birmingham:

Basic	$43.40
North. No. 2 foundry, sil. 1.75 to 2.25	$44.40 to 45.40
Southern foundry, sil. 2.25 to 2.75	48.70
Gray forge	41.40
Ohio silvery, sil. 8 per cent	61.40
Standard low phos., Valley furnace	51.00 to 53.00

Coke.—The coke situation shows some improvement in Cleveland, and local foundries are now fairly well supplied with fuel. An additional trainload of Connellsville coke reached this city Monday to supply contract orders, and railroads were able to deliver it to the plants of consumers. Standard Connellsville coke for prompt shipment is quoted at $13 ovens.

Finished Iron and Steel.—The demand for finished steel shows some improvement but mostly in bar products. Plates and structural material are very quiet, decrease in building activity now having a noticable effect on the demand for the latter. Some mills that have been able to keep filled up with plate and structural tonnage at 4c. for rather early shipment now need orders which they will take on the 3.75c. base. The curtailment of the automobile industry, resulting from the shortage of fuel and steel caused by the switchmen's strike, has caused a falling off in the demand for steel from the automobile parts manufacturers. Good steel specifications are coming from the implement manufacturers and this industry is still seeking to place third quarter contracts. Bolt manufacturers are also in the market for wire for that delivery. We note the sale of 1500 tons of Bessemer wire rods at $80 for early shipment. Little building work is developing in this city and some construction work under way has been stopped because of lack of material. General conditions have caused one Akron rubber company to defer extension plans that are estimated will require several thousand tons of steel during a two-year period. The McClintic-Marshall Co. has taken 350 tons for a plant for the Ideal Electric & Mfg. Co., Mansfield; the Maibohm Motor Co., Sandusky, has placed 230 tons with a Chicago fabricator for a plant addition, and the Timken Roller Bearing Co., Canton, has placed 200 tons for a plant extension. Hard steel bars are easier and are now being freely offered at 3.75c. The agricultural implement trade has placed orders at this price for the last half and is now well covered for its hard steel bar requirement. The Illinois Central Railroad is inquiring for

50 locomotives. The demand for sheets continues active. Mills are booking orders at 6c. to 6.25c. for blue annealed sheets for early shipment. Warehouse business is good, particularly in the smaller sections of bars, angles, bands and hoops, but stocks in the smaller sizes are very low.

Cleveland warehouses quote steel bars at 3.27c. to 5c.; plates, 3.57c. to 5c., and structural material, 3.70c. to 5.10c.

Old Material.—The scrap market is very weak. Many producers have their yards full of material which they wish to dispose of, and dealers say that they can buy this scrap at very low prices provided they can secure permits to move it. Dealers are getting material that in some cases nets them an unusually good profit in filling orders taken when the market was higher. Machine shop turnings are particularly weak. A Cleveland mill that has bought considerable steel making and blast furnace scrap has withdrawn from the market, but sales for this grade by purchasers was reported at $23.50 to $23.90. Cast scrap, grate bars and stove plate are firm. Dealers are able to make shipments a little better than a week ago.

Dealers quote delivered consumers' yards in Cleveland and vicinity as follows:

Heavy melting steel	$23.50 to $24.00
Steel rails under 3 ft	25.00 to 27.75
Steel rails, rerolling	31.00 to 32.00
Iron rails	32.00 to 33.00
Iron car axles	41.00 to 42.00
Steel car axles	36.00 to 37.00
Low phos. melting scrap	26.25 to 26.50
Cast borings	16.50 to 16.75
Machine shop turnings	12.00 to 12.25
Mixed borings and short turnings	16.00 to 16.50
Short turnings for blast furnaces	16.50 to 16.75
Compressed steel	18.50 to 19.00
Railroad wrought	28.00 to 29.00
Railroad malleable	30.00 to 31.00
Steel axle turnings	19.50 to 20.00
Light bundle sheet scrap	15.00 to 15.50
Drop forge flashings over 10 in	17.00 to 17.50
No. 1 cast	41.00 to 42.00
No. 1 busheling	18.50 to 18.75
Railroad grate bars	29.00 to 30.00
Stove plate	29.00 to 30.00
Cast iron wheels	37.00 to 38.00

St. Louis

ST. LOUIS, May 24.

Pig Iron.—Operations of the melters continue to be dependent upon the availability of metal and while the receipt of pig iron is improving somewhat, there is not enough of improvement to make operations as active as the demand for finished products. During the past week, there has been a slowing up, however, of the demand for castings and other products, due apparently to the widespread wave of price reduction and its consequent effect on the business mind. Representatives of furnaces report business at a very low ebb and that while their instructions show no change in the prices to be asked, they are not disposed to expect any great amount of new business, while most of them are looking for lower rather than stable or higher prices. No. 2 Southern is still nominally held at $42 Birmingham, basis of 1.75 to 2.25 per cent silicon. No change is reported in Northern or charcoal irons, etc.

Coke.—Inability to get cars continues to prevent the making of coke contracts for present, near future or deferred delivery and the receipts of coke under contracts, while somewhat improved, are not yet satisfactory.

Finished Iron and Steel.—In finished products there has been no change of consequence save that there is a little better delivery, although all deliveries are still much extended, even the warehouse stocks being dependent upon receipts from mills slipping through the freight congestion.

For stock out of warehouse we quote as follows: Soft steel bars, 3.94c.; iron bars, 4.50c.; structural material, 4.04c.; tank plates, 4.24c.; No. 10 blue annealed sheets, 7.09c.; No. 28 black sheets, cold rolled, one pass, 8.10c.; No. 28 galvanized sheets, black sheet gage, 9.60c.

Old Material.—No business is being done in the scrap market and practically no deliveries on old contracts are being made, save for a car or two here and there. The market is simply dead, with nothing occurring on which to base quotations. The figures given are therefore but estimates of value which might or might not stand if actual transactions were possible. The tone of the market is tending toward softness and when changes do come they will probably be in the downward direction.

We quote dealers' prices f.o.b. customer's works, St. Louis industrial district, as follows:

Per Gross Ton

Old iron rails	$32.50 to $33.00
Old steel rails, rerolling	31.50 to 32.00
Old steel rails, less than 3 ft	26.00 to 26.50
Relaying rails, standard sections, subject to inspection	50.00 to 55.00
Old car wheels	34.50 to 35.00
No. 1 railroad heavy melting steel	22.50 to 23.00
Heavy shoveling steel	21.50 to 22.00
Ordinary shoveling steel	21.00 to 21.50
Frogs, switches and guards, cut apart	24.00 to 24.50
Ordinary bundled sheets	14.50 to 15.00

Per Net Ton

Heavy axle and tire turnings	16.00 to 16.50
Iron angle bars	29.50 to 30.00
Steel angle bars	22.00 to 22.50
Iron car axles	39.50 to 40.00
Steel car axles	33.50 to 34.00
Wrought arch bars and transoms	31.00 to 31.50
No. 1 railroad wrought	25.50 to 26.00
No. 2 railroad wrought	23.50 to 24.00
Railroad springs	22.50 to 23.00
Steel couplers and knuckles	24.00 to 24.50
Locomotive tires, 42 in. and over, smooth inside	22.50 to 23.00
No. 1 dealers' forge	22.00 to 22.50
Cast iron borings	14.00 to 14.50
No. 1 busheling	21.50 to 22.00
No. 1 boiler, cut to sheets and rings	17.00 to 17.50
No. 1 railroad cast	35.00 to 35.50
Stove plate and light cast	30.50 to 31.00
Railroad malleable	26.00 to 26.50
Agricultural malleable	25.50 to 26.00
Pipes and flues	17.00 to 17.50
Heavy railroad sheet and tank	16.50 to 17.00
Railroad grate bars	27.50 to 28.00
Machine-shop turnings	13.50 to 14.00
Country mixed	19.00 to 19.50
Uncut railroad mixed	19.50 to 20.00
Horseshoes	24.50 to 25.00

EUROPEAN BUYING IMPROVES

Britain Buys Ship Plates—Japanese Resales Bring Good Prices—China Active

NEW YORK, May 25.—With the Japanese market inactive, European buying is on the increase, pig iron and ship plates being among the largest items. Despite reports from the Far East that Chinese markets were being affected by the Japanese depression, sales are being made to Hong Kong, Tientsin, Shanghai and to points in Manchuria and Corea. One exporter has received a fair-sized order from Shanghai for 16-lb. rails and a small order for 50-lb. rails from Corea. The offering of unshipped Japanese material continues and various small quantities are being purchased for shipment to other markets or for domestic consumption. Most resales of this material bring good prices, although one small tonnage of steel bars is noted at 2.90c., f. o. b. mill. In compliance with customers' requests a Japanese house has recently sold about 1000 tons of bars, wire and wire rod.

The most active market in Europe at present is England, which is buying ship and tank plates and other material. Sales of ship plates have been made to England and Scotland. One order for 3000 tons has been booked at 3.95c. f. o. b. Pittsburgh, and another of 1000 tons is reported at 3.85c., f. o. b. Pittsburgh. A small order of 400 tons from China has been placed at 4c., f. o. b. Pittsburgh. The British pig-iron shortage has caused other European countries to inquire in the United States. An exporter has recently shipped 1000 tons to Sweden and is continuing shipments of 500 tons to Rotterdam, where it will probably be transhipped into Germany. Spiegeleisen at the prevailing price is evidently not attractive to European buyers, who, although they continue to inquire for small quantities, are not buying.

An exporter to South Africa is arranging the American financing of a $2,000,000 company to exploit manganese deposits in South Africa, sales to be made exclusively to the concerns financing the company. Nearby deposits of lime, cheap labor and coke at $5 a ton are expected to contribute to cheap production.

Argentina is the leading buyer among South American countries. Fairly large inquiries for pig iron and some structural material have been received. Trans-

portation is still a serious consideration to all exporters and a large number are using the port of Philadelphia for ocean shipments. A leading independent export company reports that it is not shipping more than 25 to 30 per cent of the usual volume of business.

British Iron and Steel Market

Prices Stationary—Output Declining—Distribution Dislocated—Tin Plate Workers Demand Increase

(*By Cable*)

LONDON, ENGLAND, May 25.

The Cleveland pig iron market is unchanged. The transportation congestion is worse and the distribution of supplies is completely dislocated. The strike of the Tees dockers is holding up shipments and producers have placed an embargo on exports to neutrals. The market for East Coast hematite is unaltered and buyers are experiencing great difficulty in placing both domestic and foreign orders.

Steel prices in general are not expected to fall at present owing to the absence of competition among makers and to decreased production. The congestion among northeastern makers is chronic. Dorman, Long & Co., Ltd., have closed two mills for two weeks and the Scottish shipyards are paying off men owing to the inability of obtaining deliveries on steel plates. Important contracts for new vessels are reported canceled. Some Scotch makers of round bars have advanced prices £3 10s.

Welsh tin plate bars have sold for export at £32 f. o. b. and English sheet bars have been offered at £25 delivered. American 2-in. billets are obtainable at about £25 c. i. f. for early shipment. The tin plate market is unsettled with August-September delivery quoted at 70s. 6d. and October-December shipment at 67s. 6d. The Welsh tin plate workers are demanding a further increase in wages.

The Sambre-Moselle works are offering beams up to 500-ton lots at £33 for delivery in four or five weeks.

We quote per gross ton except when otherwise stated, f. o. b. maker's works, with American equivalent figured at $3.86 for £1, as follows:

	£	s.	£	s.		
Ship plates	26	0	to 34	0	$100.36	to $131.24
Boiler plates	28	10	to 37	0	110.01	to 142.82
Tees	26	10	to 33	0	102.29	to 127.38
Channels	25	15	to 33	5	99.40	to 128.35
Beams	25	10	to 32	0	98.43	to 123.52
Round bars, ¾ to 3 in.	28	0	to 33	10	108.08	to 129.31
Rails, 60 lb. and up	23	0	to 25	0	88.78	to 96.50
Billets	25	10	to 26	10	98.43	to 102.29
Sheet and tin plate bars, Welsh	25	0	to 32	0	96.50	to 123.52
Galvanized sheet, 24 g.	56	0	to 60	0	216.16	to 231.60
Black sheet, 24 g to 26 g.	50	0	to 54	0	193.00	to 208.44
Tin plate, base box	3	7½	to 3	14	13.00	to 14.28
Steel hoops	38	15	to 39	0	149.56	to 150.54
Cleveland basic iron	11	7½			44.88	
West Coast hematite	14	15			56.93	
Cleveland No. 3 foundry (export to allies)	10	5			39.56	
Ferromanganese	35	0	to 40	0	135.10	to 154.40
Coke	3	2¾			12.10	

Resales of Japanese Purchases Not Important—British Buying in Belgian and Dutch Markets

LONDON, ENGLAND, May 10.—Business in pig iron continues difficult because demand is still much in excess of available supplies. It is hoped that production may be increased by more furnaces being put in blast because the embargo on coke exports may increase the quantities of fuel available for home consumers. So far prices of Cleveland iron have remained unaltered. The producers have apparently been awaiting the decision of the coal controller in regard to fuel prices. It is understood that an announcement is imminent of an increase in these so that an advance in pig iron may also be expected. At the moment the price of Cleveland No. 1 is 212s. 6d. and No. 3 G.M.B. 200s. For shipment to France, Belgium and Italy the extra 5s. is still asked, while in regard to other overseas markets the price might be called 290s., but this is nominal in the absence of business. The home demand still leaves practically nothing available for export trade. The position of East Coast hematite is somewhat easier. The freights on foreign ore have been easing off, and as a consequence it is expected producers will not advance their prices. So far as supplies go, however, these are not sufficient to meet the demand. The present price of East Coast Mixed numbers is 260 s. for the home trade. As to foreign demand, this has been quieter recently, partly owing to the adverse continental exchanges and also to the fact that overseas buyers do not like the advance clause which makers insist upon putting on their contracts. Besides this, it is reported that American iron has been coming to Europe which makes buyers more conservative.

In regard to steel, quieter conditions have been noticeable also, which is partly attributed to the unsatisfactory condition of international exchange as well as to the recent financial crisis in Japan. In some quarters it is believed that an improvement will be seen in the near future in the exchange position so far as the chief markets are concerned and that demand will revive again. In any case makers are so well booked that they are in a position to disregard new business, and there is at present no sign of any easing in prices in spite of the falling off in demand. It is stated that not only have works sufficient orders to keep them going for months without new business, but also that their financial position is probably strong enough to enable them to maintain their quotations for a long time.

Some parcels of German and American steel bars have been offered for resale by Japanese firms. On the whole, however, resales due to the financial trouble in Japan have not affected the market much, as the material involved is chiefly tin plates and galvanized sheets, largely of specifications not in use elsewhere. It is interesting to note that Belgium is offering beams at prices below British quotations. It is reported that some substantial orders have been placed with iron founders in Holland for castings by engineers and shipbuilders in this country, owing to the high prices for castings ruling here. It is stated that a firm of marine engineers on the Clyde recently placed orders in Holland for the castings required for six sets of marine engines. Orders for castings valued at £100,000 are stated to have been received by one Dutch firm.

The reports of Clyde shipbuilding for April showed the total tonnage launched of 84,993 for 18 vessels. It might be mentioned that this is a record for April, except in the year 1913, when the Aquitania was included. Five of the 18 vessels launched are fitted for oil fuel as well as coal. At present there are over 1,000,000 tons of work on hand.

Fortieth Anniversary of Partnership of W. R. Warner and Ambrose Swasey

The fortieth anniversary of the partnership of Worcester R. Warner and Ambrose Swasey, founders of the Warner & Swasey Co., Cleveland, and the twentieth anniversary of the formation of the present corporation, was celebrated at the plant of that company, May 19, with a reception to invited guests in the morning and a program at the plant for all the employees during the afternoon. Addresses to the men were made by both Mr. Warner and Mr. Swasey, and the company presented a fine gold watch to each of seven employees who had been with the concern 25 years. A social hour and refreshments followed. In commemoration of the anniversary, the company published a very attractive souvenir volume containing a history of the organization, sketches of the founders and heads of the departments, and numerous illustrations. Copies of these were presented to the employees and the guests who attended the celebration.

Mr. Warner and Mr. Swasey were born in the same year, 1846, on New England farms, the former in Massachusetts and the latter in New Hampshire. Leaving the farm at the age of 19 entered the same machine shop, the Exeter Machine Works, Exeter, N. H., and worked as apprentices within a few months of one

another the same year. Here the two young men became warm friends. At the completion of their apprenticeship five years later, in 1870, both entered the employ of Pratt & Whitney in Hartford, Conn. In a short time, Mr. Warner was placed in charge of one of the company's largest departments. After working for a time as a foreman, he undertook the building of machines under contract, and attracted attention by greatly reducing production time. Mr. Swasey, while in charge of the gear cutting department, designed and constructed the epicycloidal milling machine for producing true theoretical curves from which gear teeth are made. He also invented a gear cutting machine for generating and at the same time cutting the teeth of spur gears.

On May 5, 1880, the two men, with their combined savings up to that time as their initial investment, established the firm of Warner & Swasey, and taking four young men with them as a nucleus of their organization, started in business in Chicago, but finding so few skilled men in the city at that time, they moved to Cleveland the following year and built their first factory in 1881 on a site occupied by a portion of the present plant. The firm first engaged exclusively in the manufacture of machine tools, the turret lathe from the start being its principal product. In 1881 the firm completed its first telescope, and during the following year it gained world-wide reputation in the construction of astronomical instruments. It designed and constructed the 36-in. refracting telescope located in the Lick Observatory, Mount Hamilton, Cal., which was erected in the winter of 1886-1887, this being the largest refracting telescope constructed up to that time. This instrument proved so satisfactory that the Government commissioned the firm to construct a mounting similar in design for the 26-in. objective of the United States Naval Observatory, Washington, and later the firm designed and constructed a 40-in. telescope as well as a 90-ft. dome and a 75-ft elevating floor for the Yerkes Observatory, Williams Bay, Wis.

The firm and the present company also won distinction in building range finders, gun site telescopes and other military instruments for the Government.

In 1890 the business was incorporated under the name of the Warner & Swasey Co., and plans were made for the complete reconstruction of the plant. In that year the company brought out its hollow hexagon turret lathe and the following year the universal hollow hexagon turret lathe. During the war, the company won a distinguished record for Government service, contributing men and machinery, and received a certificate of merit from the Government. In 1909 an important addition to the company was made when Frank A. Scott became associated with it as secretary and treasurer and director. In 1916 he became vice-president.

Both Mr. Warner and Mr. Swasey have had many honors conferred upon them. Mr. Warner is a charter member of the American Society of Mechanical Engineers and was vice-president of that organization in 1897. He is past president of the Cleveland Engineering Society and past president of the Cleveland Chamber of Commerce, a trustee both of the Case School of Applied Science and of Adelbert College, Cleveland, and actively associated in an official capacity with several Cleveland banks. Mr. Swasey was one of the organizers of the American Society of Mechanical Engineers, of which he is a past president. He is a member of various foreign engineering and scientific societies.

Foundries of the Chambersburg Engineer Co., the Wolf Co., the Chambersburg Foundry Co., and the Nute, McGhee & Geary Co., Chambersburg, Pa., have been closed indefinitely by a strike of molders and molders' helpers, starting May 18. The molders' scale in the Chambersburg plants had been 68c per hr., and the men are holding out for 90c per hr. Proprietors have offered to compromise at 83c, but the men have refused all overtures thus far. The Chambersburg Foundry Co. had started operations only a week before the strike, and had hoped to get a sufficient supply of castings ahead, to start operations in the machine shop.

IRON AND INDUSTRIAL STOCKS

Favorable Developments Overlooked and Prices Have Continued Soft

Reductions in prices for steel products and for certain kinds of wearing apparel, pessimistic crop reports, heavy selling of Liberty bonds and continued stringent regulation of loans caused a further setback in security values the past week, the decline in United States Steel to below $90 a share being a conspicuous market feature.

There have been days when stock prices have rallied somewhat on indications of improved railroad transportation conditions within the not distant future. But banking interests evidently are not in a receptive mood for encouraging news. Such optimistic market influences such as the March quarter report of the Colorado Fuel & Iron Co., higher automobile prices, and the improbability of soldier bonus legislation being passed by Congress this session, have been offset.

Good buying of stocks is noticeable on all declines, however, people with funds realizing certain securities are selling well below intrinsic value. This buying and short covering largely account for what price recoveries have resulted.

The range of prices on active iron and industrial stocks from Tuesday of last week to Wednesday of this week was as follows:

Allis-Chalm. com.	30½ - 33⅞	Midvale Steel.....	40⅜ - 42⅜
Allis-Chalm. pf...	— - 74¼	Nat.-Acme	32½ - 34½
Am. Can com....	35½ - 40	Nat. E. & S. com.	63⅜ - 67½
Am. Can pf.....	90 - 90¼	N. Y. Air Brake.	92 - 97¼
Am. C. & F. com.	128¼ - 133½	Nova Scotia Steel.	49⅜ - 51
Am. C. & F. pf...	106 - 106¼	Pittsburgh Stl. pf.	83 - 83⅛
Am. Loco. com...	87 - 92½	Press. Steel com.	90 - 97
Am. Steel F. com.	35 - 39½	Press. Steel pf....	95 - 98
Am. Steel F. pf...	86 - 87½	Ry. Stl. Spg. com.	88¾ - 92
Bald. Loco. com..	106½ - 115⅝	Replogle Steel....	83 - 87½
Bald. Loco. pf....	99⅝ - 99⅞	Republic com.....	84½ - 92½
Beth. Steel com..	82 - 85¼	Republic pf.....	94 - 96½
Beth Stl., Cl. B..	85¼ - 91¼	Sloss com.....	61 - 66¼
Beth. Stl., 8% pf.	— - 105	Sloss pf.....	89 - 89½
Case, J. I., pf....	93 - 94	Superior Steel.....	41 - 47½
Chic. Pneu. Tool.	81½ - 86	Transue-Williams.	48¼ - 52
Colorado Fuel.....	28 - 30⅞	Un. Alloy Steel...	41 - 41⅝
Cru. Steel com...	115½ - 136½	U. S. Pipe com...	16 - 17
Gen. Electric.....	134 - 142½	U. S. Pipe pf.....	45 - 46
Gt. No. Ore Cert.	33⅞ - 36¼	U. S. Steel com...	89⅝ - 94¼
Gulf States Steel.	55½ - 63	U. S. Steel pf.....	104½ - 106
Int. Har. com....	118 - 123½	Vanadium Steel..	66 - 75
Lackaw. Steel....	63 - 74	Va. I. C. & Coke.	98 - 104
Lake Sup. Corp..	12¼ - 14⅜	Westingh. Elec...	45⅛ - 48¼

Minnesota Steel Co. Extensions

The Minnesota Steel Co., Duluth, Minn., was granted permits on May 17 by the building inspector of Duluth, to erect a wire mill, casting and dip house, a dross refinery, sulphate mill, and 248 dwellings, the aggregate value of the permits being $4,000,000. According to Louis C. Reis, general superintendent, the company is merely proceeding with extension work projected for 1920 several months ago. Work will now be pushed so that the new facilities may be available by fall.

The Blaishill Wire Machinery Co., Montreal, has opened a new show-room and offices at 307 St. James street in the machinery district of Montreal and will handle new, used and rebuilt machinery, tools, and contractors' equipment and will also specialize in wire products' machinery. The company would like to receive manufacturers' catalogs with dealers' prices. It also wishes to come in touch with United States firms having used machine tools to dispose of, particularly medium and large machines.

C. A. Beck, of Bethlehem, Pa., was elected president at the annual meeting of the stockholders of the Cornwall Ore Banks Co., a subsidiary company of the Bethlehem Steel Co., held at the company offices at Miners' Village, near Lebanon, Pa. Other officers elected include E. B. Hill, Bethlehem, treasurer; William Coleman Freeman, Cornwall, secretary, and Harrison Souder, Miners' Village, general manager.

German Iron Trade Grappling with Obstacles

Skyrocketed Prices Replaced by New Scale of Higher Than Recent Nominal Prices — Losses by Strike, Coal Scarcity and French Ownership

(*Special Correspondence*)

BERLIN, GERMANY, May 3.—In the final negotiations a week ago at Duesseldorf for the completion of the self-governing body for the iron trade, the producers raised energetic objections to the division of membership. It had been proposed by the Government's plan that producers—together with their employees—should have 34 out of a total of 70 seats; but in these latest negotiations the producers demanded that the number of members be raised to 72 and that they have 36 of these. This concession was agreed to.

The price question was then taken up and large advances made. The assurance was given, however, that, while prices were nominally marked up, they are really lower than before. In the first place, the practice of demanding foreign exchange in payment for one-half to three-fourths on home orders was dropped upon the insistence of the Government; and, besides this, list prices in force heretofore merely existed on paper. Far higher prices were actually paid.

The latest price advances are shown in marks in the following table, together with a comparison with three previous dates:

	July, 1914	Dec. 1, 1919	April 1, 1920	Present prices
Ingots	83.50	1430	2.407	2.650
Blooms	87.50	1465	2.442	2.900
Billets	95	1500	2.477	3.125
Slabs	97.50	1565	2.482	3.200
Structural forms	112	1715	2.772	3.620
Bars	98-100	1745	2.802	3.650
Wire rods	117.50	2000	3.302	4.150
Heavy plates	105	2260	3.587	4.700
Medium plates	110	2545	4.022	5.535
Thin plates	125	3185	4.087	5.600

Dealers are allowed to add 4 per cent to these prices when shipment is made directly from the mills, or 20 per cent when made from their warehouses. Surprise has been expressed at the large increase in the price of blooms as compared with ingots. Hitherto the difference had been only 35 marks; in the new list it is 250 marks. No explanation for the marked change has been offered.

Advances in Pig Iron

The Pig Iron Association also marked up prices last week, dating back to April 1. Hematite was raised from 1,718.50 to 2,338 marks (79.50 marks before the war); foundry from 1,324.50 to 1,776; Siegerland steel-making iron from 977 to 1,671.50. It is said that the lists published still demand payment in foreign exchange for iron to be used in manufacturing products for export. These increases were partly accounted for by a further advance of coal and coke prices at the beginning of April. Further advances in ores also operated in the same direction. Their prices were recently raised by 50 marks a ton (262.60 marks) for crude ores; and 75 marks (to 393.50) for roasted ores —both dating back to April 1.

The new coal and coke prices are as follows: Bituminous nut, 233 marks against 203 previously (15 marks before war); anthracite nut, 257 marks against 224; blast furnace coke, 280 marks against 244 (17 marks before war); and 385 marks for broken coke, against 292 marks. Brown coal (lignite) has also been marked up by 12 to 40 marks a ton.

Steel Export Advances

Steel export prices have also again been advanced. For Sweden, Finland and Poland the new price for bar is 500 Swedish crowns (a raise of 50), for Norway 550 crowns (50 up), for Denmark 625 crowns (75 up), Holland and its colonies 300 gulden (60 up), and for Switzerland 650 francs (100 up). Bands and shapes have also been advanced as follows: Sweden, inland and Poland by 50 Swedish crowns; Norway by 70 crowns; Denmark by 75 crowns; Holland by 60 gulden, and Switzerland by 100 francs. These are the prices for ordinary basic steel goods, loaded on cars at Oberhausen. The aim in this readjustment is reported to have been to enforce a bottom price of 7,500 marks a ton for bars and structural forms.

Other home prices have been marked up. The piping association has added another 150 per cent to its list, and the rivet makers 200 per cent. The actual advance on gas and boiler piping is stated to range between 215 and 302 marks a ton.

Within a few days a conference with the Government authorities is to be held for the purpose of fixing list prices for scrap and old iron. It is expected that a sliding scale will be adopted, which will vary according to the changes in Siegerland steel-mixing iron. The demand for scrap and waste has kept up well in view of the scarcity of pig iron, and it is probable that higher prices will be adopted.

Confiscation of Shipping Reducing Ore Imports

The further confiscation of German shipping by the Entente—every vessel above 1600 tons and half of those between that tonnage and 1000 tons are demanded—has awakened grave apprehensions in the iron trade, especially in respect to the further shipment of ores from Sweden, which now supplies nearly all of the foreign ores consumed in Germany. In the note of protest sent to the Entente governments by Germany it was pointed out that Germany imported 3,000,000 tons of iron ores from Sweden before the war, and that vessels aggregating 300,000 gross tonnage would be necessary to handle that amount of ores in a year; yet the Entente now proposes to leave Germany only 100,000 tons, only a small part of which is suitable for ore shipments.

No Ore Yet from Ukraine

On the other hand, it is reported that industrial circles are now disposed to regard the matter as not so serious as at first feared; even a gradual relaxation of ore freight rates is proceeding. Serious efforts have been made for some months to get trade upon its feet again between Germany and the Black Sea ports of Russia, in order to obtain bog ores from the Ukraine; but these efforts have not yet met with success. The statement was made in the French Chamber of Deputies several days ago that the shipments of minette ores from Lorraine into Germany in 1919 amounted to 1,147,900 tons. (The total consumption of iron ores in Germany in 1912 was 42,500,000 tons.)

Production Loss in Ruhr District 300,000 Tons

The recent labor troubles in the Ruhr district caused a loss of 300,000 tons in the production of iron and steel products, and as a consequence manufacturers are further behind with deliveries than before. The works continue to have great difficulties in obtaining coal. A circular inquiry recently made and answered by some twenty important firms affords eloquent testimony on the subject. It was shown that most of the works have had to shut down altogether at times during the past winter for lack of coal or coke; and as a rule they have been getting only one-fourth to one-half of their requirements. For the past month, however, coal has been produced in that district at a relatively satisfactory rate—that is, production is somewhat higher than it had been.

Four of Luxemburg's 49 Furnaces Operating

In the Silesian district the Entente commission now sovereign there has adopted a scale of division of coal that causes great dissatisfaction. Under it Poland has the first call on Silesian coal; it must get all it

wants before any other consumers are served. Next comes German Austria, then Italy, then the railroads, next Upper Silesia itself, and finally Germany. It is mentioned that the iron industry in Poland is still in a bad way; most of the furnaces are out of blast owing to lack of coal. At another point of the compass, too, the lack of coke is hurting the iron industry. In Luxemburg further furnaces have had to bank their fires for that cause; and now out of a total of 49 furnaces in the duchy only four are in full blast. That little country has just put into force export duties on iron and steel goods—40 francs a ton on foundry iron, 60 on half-rolled steel, and other products in proportion.

Further French Control in Saar District

The French continue their process of ousting German companies from the Saar district. In previous letters I told that they secured majority control over important works, including the famous Stumm company. A later development along this line is the sale by the Mannesmann Tubing Co., Duesseldorf, of its branch works in the Saar district. It consists of an open-hearth steel plant, with electric steel furnaces; and it produced about one-third of the entire pipe output of Mannesmann, which has had what amounted hitherto almost to a monopoly in the German pipe trade. It has sold a 60 per cent interest in the establishment to French capitalists, whose names have not yet been published. It is understood that Mannesmann took this action under compulsory circumstances. Since the occupation of the Saar district by the French no coal can be secured there from the adjacent Lorraine mines, whereas nearly all the coal mined on the Saar is shipped to Alsace-Lorraine, or further into France. Neither has it been possible for Mannesmann to bring in coal from the Ruhr. The new company will have its head office in Paris, but the Mannesmanns will still have two of the five directors. All the important works on the Saar except one have now passed under French control.

Meanwhile the Stumms are still casting about for new connections. Besides their deal with Gelsenkirchener Gussthal, mentioned in my last report, it is reported that they are about to acquire control over the Humboldt Machine Works at Cologne; and they are said to be in negotiations with other western establishments.

Numerous German Amalgamations

Still other deals and amalgamations are going on as the result of the upset conditions brought about by the war. It has already been mentioned in this correspondence that two of the greatest German iron companies—the Gelsenkirchener Bergwerk and the Deutsch-Luxemburg companies—had to dispose of their interests in Lorraine and Luxemburg. These operations left both companies in a somewhat crippled condition; and now they are reported to be negotiating an amalgamation into one great company. Their combined capital amounts to 320 million marks, which would make the new combination the strongest company in the German iron trade. It is promised that the negotiations will be perfected by the end of this month. Deutsch-Luxemburg will have the lead in the new company, which would make Hugo Stinnes the most important ironmaster of Germany.

Another company uprooted in Lorraine, the Rombacher Huettenwerke, has just acquired the Concordia Coal Co., which was one of the most important collieries in Germany not yet absorbed by an iron company. Rombach pays 41,000,000 marks for the property. August Thyssen, who had to dispose of his great modern steel mills at Hagendingen, Lorraine, has now secured the majority of the common stock of the Geisweider Eisenwerke, which is the most important establishment in the Siegerland district; while the Lothringer Bergwerke and Huettenverein (Aumetz-Friede), another of these uprooted Lorraine establishments, has bought the majority of its preferred stock. Thyssen has also got control of the Charlottenhuette in the Siegerland district.

Krupp also continues his quest for new fields to conquer. His latest deal is with the Maschinenfabrik Buckau, of Magdeburg and Buckau, for taking up the building of dredges. That concern manufactures dredges that are used especially in coal mining. This and similar deals previously mentioned by me are designed to provide Krupp with means for consuming his steel output for own account.

Some foreign concern, it is reported, is negotiating for the purchase of the Stahlwerk Becker. Companies in the iron and other lines have latterly been increasing their capital in the form of preferred shares of low interest and very high voting power—some as high as 15 to 20-fold the common stock—precisely with a view to preventing foreigners buying control over them.

The Buderus Eisenwerke of Wetzlar reports gross profits of 10,779,000 marks for the past calendar year, as compared with 7,712,000 for 1918. The Oberschlesische Eisen-Industrie of Gleiwitz, in Silesia, earned 16,359,000 marks gross, against 12,708,000 for 1918. The company proposes to increase its capital by 12,000,000, raising it to 50,000,000 marks.

NEW FRENCH COMPANIES

Further Developments in Taking Over Plants in Saar, Lorraine, etc.

(*Special Correspondence*)

PARIS, FRANCE, May 12.—The Société des Forges et Aciéries du Nord et Lorraine has been formed with a capital of 80 million francs to take over the Mines et Usines d'Uckange (patrimony of Gebrüder Stumm, Dillinger Hüttenwerke, placed under sequester), which had been attributed to the Société Metallurgique de Nord et Lorraine by a judgment of adjudication of the tribunal of Metz on Dec. 31, 1919. This property comprises:

1—The following iron mines: Lorraine, Witten, Carl Ferdinand, Boulenberg, which in 1913 produced 1,470,000 metric tons of iron ore; Ida, whose exploitation began in 1914 and which is now producing 400,000 tons of iron ore a year; iron ore concessions of Boulange, Halberg, Neunkirchen, Chatel, Michelsberg as yet unexploited. The total area of the mining domain is 7450 acres.

2—The Usines d'Uckange, situated in the valley of the Moselle, 7 kilometers south of Thionville; these plants comprise six blast furnaces of 130 to 180 tons. This industrial ensemble, which includes a central electric plant, industrial buildings, offices and workmen's houses, is joined to the Ida mine by an aerial transporter of 17 kilometers In 1913 the production of the blast furnaces of Uckange was 260,000 tons of pig iron.

The Société des Forges et Aciéries du Nord et Lorraine have moreover concluded preliminary agreements in view of acquiring important participation in the Etablissements Gebrüder Stumm in the Saar as follows:

1—Usines de Neunkirchen, acquisition of 60 per cent of the Usines de Neunkirchen, which constitutes an ensemble completing the mines and usines of Uckange and belonging to the Stumm company. These plants comprise 377 coke ovens joined directly to the producing mine with installation for the recuperation of by-products, six blast furnaces of 160 to 180 tons, a central electrical plant, four 25-ton converters, a mixer, two open-hearth furnaces of 35 tons, two electric furnaces, two blooming and one reversible billet cage, and a four-stand reversible mill, besides wire mills. The production of the Neunkirchen plant in 1913 was 270,000 metric tons of pig iron and 460,000 tons of steel from the pig iron of Uckange and that made on the spot.

2.—The Usines de Hombourg, acquisition of 40 per cent of these plants, which are entirely modern and specialize in the manufacture of tubes, bolts, etc.

3—Dirmingen brick works, lime kilns of Herbitz-

heim, Blickweiller and Gersheim and the quarries of Dolomie de Weillen.

The company has issued 240,000 shares at 6 per cent. The directorate includes such important metallurgical firms as Trefileries d'Angers, les Usines Metallurgiques de la Basse-Loire and les Forges et Acieries du Nord-Est.

Pourparlers have been begun between the Bochumer Verein and the Mannesmann Rohrenwerke for the taking over of the latter by the Bochumer Verein. There is also question of fusing the Aciéries de Witten and the Usines Königshaven. Finally negotiations are underway between the Gelsenkirchener Bergwerke and the Deutsch-Luxemburgische for the fusion of these enterprises. The directors of the Mannesmann Rohrenwerke have just concluded an agreement with a French group according to the terms of which the plant of the company situated in the Saar, at Sarrebruck, which are separated from the parent company, will be operated as an autonomous enterprise. A new company will be created in which the French group will participate to the extent of 60 per cent. For the cession of its property, Mannesmann will receive thirty million francs, not including supplies, which are figured separately.

The Societé des Mines de Fer de Rochonvillers is to take over the iron mines of Rochonvillers, Werder, Pennsbrumer, Octrange, Albert von Oppenheim and Langenberg, situated in the department of the Moselle. These beds are situated in the basin of Thionville (prolongation in Lorraine of the Briey basin) and they contain more than thirty million metric tons of ore of the first quality. These mines, which were taken over by the French government at the time of the armistice, are to be worked by the Societé de Mines de Fer de Rochonvillers for 99 years, the French government to participate in the profits according to the formula of new French legislation. These mines are exploited by galleries on the hill sides and do not necessitate the digging and upkeep of costly shafts. During the years preceding the war the annual extraction amounted to between 600,000 and 700,000 metric tons.

Le Creusot in Polish Plant

The Forges et Aciéries de Huta-Bankowa, a strong metallurgical company whose plant in Poland produced before the war 110,000 metric tons of pig iron, 170,000 tons of steel and 140,000 tons of finished products suffered much from developments of the world war, but thanks to measures taken on the cessation of hostilities the plant is now ready to resume its industrial activity at least partially. The company has decided to increase its capital of 57 million francs by issuing 114,000 new shares at 500 francs a share. The Creusot works has taken 22,000 shares and the 92,000 remaining have been offered by preference to old shareholders at the price of 540 francs, two new shares for an old one.

Luxemburg's Export Taxes

A decree just issued by Luxemburg fixes the export tax which is to be collected as of May 1 for mining and metallurgical products: 40 francs a ton for pig iron; 60 francs for iron and steel in ingots, bars, billets, sheets, etc.; 25 francs for scrap; 1 franc a ton for ore, slag, etc. These taxes may be modified at the end of each month by the director general of commerce, industry and labor.

Trumbull-Cliffs Furnace Co. Will Build By-product Coke Plant

A by-product coke works is to be erected in connection with the 600-ton blast furnace which the Trumbull Steel Co., Warren, Ohio, is building in connection with the Cleveland-Cliffs Iron Co., through the Trumbull-Cliffs Furnace Co. Work on the big stack will be pushed to completion as rapidly as possible. The Cleveland-Cliffs company is placing its own organization in charge of construction.

Stockholders of the Trumbull Steel Co. approved an increase in the authorized common capitalization from $14,000,000 to $25,000,000 at a special meeting May 18. The board of directors was increased from five to seven and W. G. Mather and S. L. Mather of Cleveland were elected. Shareholders approved the setting aside of 20,000 shares of common stock, par value $100, for sale to employees on an installment payment basis.

With the increase, the Trumbull company is capitalized at $35,000,000, of which $10,000,000 is preferred. The stock increase was made for the purpose of permitting a common stock dividend to be paid, states President Jonathan Warner.

Hill, Clarke & Co. Sell New York Business

Hill, Clarke & Co., machinery dealers, have sold to the Henry & Wright Mfg. Co., Hartford, Conn., their lease of the New York office and store at 136 Cedar Street, and the business will be continued as the New York Machinery Sales Division of the Henry & Wright Mfg. Co. Through this office will be sold the Henry & Wright drilling machines and metal dieing machines. Most of the miscellaneous machine tool lines represented in the past by Hill, Clarke & Co. will be retained.

The entire sales organization of Hill, Clarke & Co., including F. Suess, manager, will continue with the Henry & Wright Mfg. Co. The latter company has been engaged in manufacturing machinery since 1903. F. M. Smith is president; D. M. Wright is secretary, treasurer and general manager.

Westinghouse Net Larger

The fiscal year of the Westinghouse Electric & Mfg. Co. closed March 31. Though gross sales for the fiscal year, recently closed, decreased to $136,052,092 from $160,379,943 the year before, the net income was greater, being equivalent after preferred dividends, to $10.53 a share, compared with $10.43 of the year before. The increase in the surplus was caused chiefly by a decrease of $23,695,140 in selling costs, which last year totaled $120,972,262. Unfilled orders on April 1 amounted to $71,156,732. According to Guy E. Tripp, chairman of the board, "the current demand for the products of your company is in excess of its present plant capacity and a continuation of this demand will make necessary further additional facilities and still larger working capital."

Electric Alloy Steel Co. Plans

Stockholders of the new Electric Alloy Steel Co., Youngstown, Ohio, have ratified the purchase of a going property in western Pennsylvania as a means of avoiding delays incident to construction of a new plant. It was furthermore decided to maintain the plant in its present location for an indefinite period. Directors considered the advisability of moving the units to a site in Trumbull County, Ohio, where the company planned to build. By this step the company will be enabled to enter production much sooner than if it attempted to build a works. L. J. Campbell is president.

First Ford Furnace Started

The first of the two blast furnaces which have been under construction at the River Rouge plant of the Ford Motor Co. was put in operation Monday, May 17, when Henry Ford, holding in his arms Edsel B. Ford's three-year-old son, Henry Ford III, helped the child light a match and fire oil-soaked excelsior, which touched off the charged stack. The 500 tons of pig iron which henceforth will be produced daily will be increased to 1000 tons daily when the second furnace is put in operation.

Since the opening of the Cincinnati office of the Ordnance Salvage Board, about one year ago, retail sales of machine tools totaling $2,750,000 have been made, exclusive of $500,000 worth sold to Belgium. According to local officials of the Ordnance Department, the average sale price of the tools amounted to 78 per cent of their original cost. Practically all the machine tools allotted to this district have been disposed of, and this section of the office will, it is understood, be discontinued in the near future.

Non-Ferrous Metals

The Week's Prices

Cents Per Pound for Early Delivery

	Copper New York		Tin	Lead		Zinc	
May	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
19	19.00	19.00	53.12½	8.50	8.15	8.00	7.65
20	19.00	19.00	52.75	8.50	8.15	7.95	7.60
21	19.00	19.00	52.62½	8.50	8.15	7.90	7.55
22	19.00	19.00	....	8.50	8.15	7.90	7.55
24	19.00	19.00	53.00	8.50	8.15	7.95	7.60
25	19.00	19.00	51.00	8.50	8.15	7.95	7.60

NEW YORK, May 25.

Two important factors still depress the markets: The continued transportation demoralization and the reaction in the London markets. Copper demand is very moderate but prices are stationary. Buying of tin for future shipment has slackened and prices are lower. The lead situation is practically unchanged. The zinc market shows no improvement and prices are still declining. The antimony market is lower.

New York

Copper.—The unsatisfactory transportation conditions, particularly in the East, show very little improvement and it is here that most of the copper is refined and shipped to consumers. Some of the refineries have had to shut down temporarily and some have been able to start operations again, but it is safe to say that production is considerably less than 50 per cent of capacity. Buying is only moderate so far as domestic consumers are concerned, but purchases for foreign account continue fairly good. It is stated that of the refined production of the first four months of the year about 42 to 43 per cent was exported. Estimates are to the effect that the foreign countries took 256,000,000 lb. in the first four months, of which Japan is credited with about one-fourth, or 67,000,000 lb. The quotations of the leading producers continue unchanged and firm at 19c., New York, for both electrolytic and Lake copper for early delivery, with 19.25c. to 19.50c. asked for July-August shipment. In the outside market isolated sales of small amounts have been made as low as 18.12½c. to 18.25c.

Tin.—The general market has been quieter the past week than those immediately preceding and purchases of future shipment Straits have fallen off, the total since a week ago having been about 300 tons. The London market has continued to decline and consumers here are apparently afraid to enter the market and are waiting for the bottom of the London market to be reached. One seller sold last week Thursday and Friday a fair amount for future shipment, but there is no widespread demand for any brand of tin. Last week Friday Banca tin for shipment in 30 days from Europe sold as low as 48.87½c. Because of the holiday in London, the markets were closed yesterday, and as a result business here was stagnant. Buying for future shipment last week, already referred to, was at prices ranging from 51.50c. to 53.75c., depending upon the position. About 125 tons of 99 per cent tin for delivery in August was sold around 49c. to 49.75c. To-day the London market is again lower by £6 per ton, the quotation being £289 for spot Straits. A week ago the quotation was £302 per ton. Arrivals thus far this month have been 6180 tons, with the quantity afloat reported as 1340 tons. Arrivals of tin ore thus far this month have been fairly large at 3180 tons. Spot Straits tin is lower to-day at 51c. New York.

Lead.—The lead market has been quiet but steady and practically featureless. Spot and nearby lead continue scarce in this market, as high as 9.37½c., exstore, having been paid for spot shipment and 8.75c. for prompt shipment from the West. For later deliveries 8.50c., New York, has been realized. We quote the outside market at 8.15c., St. Louis, or 8.50c., New York, with the price of the leading interest unchanged at 8.25c., St. Louis, or 8.50c., New York. Because of the better railroad situation in the West, compared with the East, it is believed that production is gaining somewhat on consumption.

Zinc.—The market continues in its stagnant and lifeless condition. Because of the general transportation situation there is no incentive for buyers to enter the market nor sellers to offer their product. The only business being done is that which is necessary to satisfy regular consumers and this, while small, is being done at the prevailing quotations. Prime Western for delivery this side of August is quoted, more or less nominal, at 7.60c., St. Louis, or 7.95c., New York, with a premium asked for more forward shipments.

Antimony.—This market has declined, partly due to the decline in silver. The better grades in wholesale lots for early delivery are quoted at 9.25c. to 9.50c., New York, duty paid, with the lower grades selling at 9c., New York.

Aluminum.—Wholesale lots for early delivery of the virgin metal, 98 to 99 per cent pure, are quoted at 33c., New York, by the leading producer and 31.50c., New York, by other interests.

Old Metals.—The only item showing activity is lead. Red and yellow metals are moving very slowly, the tendency of sellers being to hold for a reaction in the market. Dealers' selling prices are nominally as follows:

	Cents Per Lb.
Copper, heavy and crucible	18.75
Copper, heavy and wire	17.75
Copper, light and bottoms	15.75
Brass, heavy	14.00
Brass, light	10.00
Heavy machine composition	18.00
No. 1 yellow rod brass turnings	11.00
No. 1 red brass or composition turnings	15.75
Lead, heavy	7.75
Lead, tea	6.00
Zinc	5.75

Chicago

MAY 25.—Copper is dull and has declined. Tin has fallen sympathetically with the London market and considerable buying has developed on the decline. Lead is difficult to procure and has stiffened as a result of a steady demand. Spelter is quiet but slightly stronger than a few days ago; it has also declined. Antimony is very dull. In the old metals numerous price reductions have been made. We quote Lake copper 19.25c. for carloads. tin 58c. to 60c., lead 8.70c., spelter, 7.75c., and antimony, 11c. On old metals we quote copper wires, crucible shapes, 14.50c.; copper clips, 14.50c.; copper bottoms, 13.50c.; red brass, 14.50c.; yellow brass, 11.25c.; lead pipe, 6.75c.; zinc, 5c.; pewter, No. 1, 35c.; tinfoil, 38c., and block tin, 47.50c., all these being buying prices for less than carload lots.

St. Louis

May 24.—The non-ferrous markets have been quiet, with lead in car lots quoted at 8.50c. and spelter at 7.90c., with relatively little business. In less than car lots the quotations are: Lead, 9c.; spelter, 9c.; tin, 63c.; copper, 20c.; antimony, 12c. In the Joplin district the ore markets have been quiet with lead, basis 80 per cent, down to $100 per ton; zinc blende, basis 60 per cent, $42.50 per ton and calamine, basis 40 per cent, $33 per ton. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 9c.; heavy yellow brass, 10.50c.; heavy red brass, 15c.; heavy copper and copper wire, 15.50c.; light copper, 13c.; pewter, 35c.; tinfoil, 43c.; zinc, 5c.; lead, 6c.; tea lead, 3c.

The National Steel Rolling Co., 203 Keyser Building, Baltimore, will receive bids up to June 10 for the first building of its proposed new plant in the Lansdowne section. The structure will be one-story, 70 x 140 ft., and is estimated to cost about $100,000, including machinery. This equipment will include rolling mill machinery, machine tools, forge shop apparatus, electric motors and equipment, etc. The plant will have an initial capacity of about 25 tons of bar iron and steel per day. Headquarters of the company are at 295 Passaic Street, Newark, N. J.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh on finished iron and steel products, with revisions effective from Jan. 1, 1920, in carload lots, to points named, per 100 lb., are as follows:

New York, 27c.; Philadelphia, 25c.; Boston, 29½c.; Buffalo, 21c.; Cleveland, 17c.; Cincinnati, 23½c.; Indianapolis, 24½c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; St. Paul, 49½c.; all in carloads, minimum 36,000 lb. To Denver the rate is 99c., minimum carload 40,000 lb.; Omaha, 59c., minimum carload 36,000 lb.; New Orleans, 38½c., minimum carload 36,000 lb.; Birmingham, 57½c., minimum carload 36,000 lb. To the Pacific Coast the rate is $1.25 per 100 lb. on articles of iron and steel, minimum carloads 80,000 lb., while the structural steel rate is $1.25, minimum carload 50,000 lb., or $1.315, minimum carload 40,000 lb. The rate on ship plates, Pittsburgh to Pacific Coast, is $1 per 100 lb., minimum carload 80,000 lb. On wrought iron and steel pipe, the rate from Pittsburgh to Kansas City is 56c., to St. Paul, 49½c.; to Denver, 99c.; to Omaha, 56c., all in carload lots, minimum 46,000 lb. To Jacksonville, Fla., all rail carloads, 41½c., minimum 36,000 lb., less than carloads, 59c.; rail and water, carloads 34½c., minimum 36,000 lb.; less than carloads 46½c. On iron and steel items not noted above, the rates vary somewhat, and are given in detail in the regular railroad tariffs.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in., on one or both legs, ¼ in. thick and over, and zees, structural size, 2.45c. to 4c.

Wire Products

Wire nails, $3.25 to $4 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of $1.50 and shorter than 1 in., $2. Bright basic wire, $3 to $3.50 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3 to $3.50; galvanized wire, $3.70 to $3.95; galvanized barbed wire and fence staples, $4.10 to $4.45; painted barbed wire, $3.40 to $3.75; polished fence staples, $3.40 to $4.50; cement-coated nails, per count keg, $2.85 to $3.75; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 60 per cent off list for carload lots, 59 per cent for 1000-rod lots, and 58 per cent for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....$4.50 base
Large boiler rivets..... 4.60 base
Small rivets .....50 per cent off list
Small machine bolts, rolled threads,
40, 10 and 5 per cent off list
Same sizes in cut threads.....40 and 5 per cent off list
Longer and larger sizes of machine bolts,
30 and 10 per cent off list
Carriage bolts, ¾ in. x 6 in.:
Smaller and shorter, rolled threads.40 and 5 per cent off list
Cut threads .....30 and 10 per cent off list
Longer and larger sizes.....30 per cent off list
Lag bolts .....50 per cent off list
Plow bolts, Nos. 1, 2 and 3 head.....40 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts ⅜ in. x 4 in.:
Smaller and shorter.....35 per cent off list
Longer and larger sizes.....25 per cent off list
Hot pressed and cold pressed sq. or hex. blank nuts.2c. off list
Tapped nuts .....$1.75 off list
Semi-finished hex. nuts, U. S. S. and S. A. E.:
⅝-in. and larger.....60 and 5 per cent off list
9/16-in. and smaller.....70 and 5 per cent off list
9/16-in. and smaller, A. L. A. M. or S. A. E.,
70, 10 and 5 per cent off list
Stove bolts in packages.....70 and 10 per cent off list
Stove bolts in bulk.....70, 10 and 2½ per cent off list
Tire bolts .....55 and 10 per cent off list
Track bolts .....6c. base

One cent per lb. extra for less than 200 kegs. Rivets in 100-lb. kegs 25c. extra.

All prices carry standard extras f.o.b. Pittsburgh.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $52 to $70; chain rods, $75 to $80; screw rivet and bolt rods and other rods of that character, $65 to $70. Prices on high carbon rods are irregular. They range from $75 to $100, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes, ½ to 9/16 in. and larger, $4 per 100 lb. in lots of 200 kegs of 200 lb. each or more; spikes, ⅜-in. and 7/16-in., $4.25; 5/16-in., $5; track bolts, $4.90 to $5. Boat and barge spikes, $4.50 per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh. Tie plates, $3 to $4 per 100 lb.

Terne Plates

Prices of terne plates are as follows: 8-lb. coating, 200 lb., $13.80 per package; 8-lb. coating, I. C., $14.10; 12-lb. coating, I. C., $15.80; 15-lb. coating, I. C., $16.80; 20-lb. coating, I. C., $18.05; 25-lb. coating, I. C., $19.30; 30-lb. coating, I. C., $20.30; 35-lb. coating, I. C., $21.30; 40-lb. coating, I. C., $22.30 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.35c. to 4c. from mill. Common bar iron, 4.50c.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card, discounts on steel pipe applying as from Jan. 14, 1920, and on iron pipe from Jan. 7, 1920:

Butt Weld

Steel			Iron		
Inches.	Black	Galv.	Inches.	Black	Galv.
⅛, ¼ and ⅜...	47	20½	⅛ and ¼.....	1	+25
½	51	36½	⅜	25½	+ 1½
¾ to 3.....	54	41½	½	29½	11½
			¾ to 1½.....	34½	18½
			2 and 2½.....	33½	17½

Lap Weld

2	47	34½	1¼	24½	9½
2½ to 6.....	50	37½	1½	31½	17½
7 to 12.....	47	33½	2	28½	14½
13 and 14.....	37½		2½ to 6.....	30½	17½
15	35		7 to 12.....	27½	14½

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜...	43	25½	¼	+7	+40
½	48	35½	⅜	23½	6½
¾ to 1½.....	52	39½	½	28½	15½
2 to 3.....	53	40½	¾ to 1½.....	34½	19½
			2 and 2½.....	34½	19½

Lap Weld, extra strong, plain ends

2	45	33½	1½	27½	13½
2½ to 4.....	48	36½	2	29½	16½
4½ to 6.....	47	35½	2½ to 4.....	31½	19½
7 to 8.....	43	29½	4½ to 6.....	30½	18½
9 to 12.....	38	24½	7 to 8.....	22½	10½
1¼	21½	6½	9 to 12.....	17½	5½

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots and on butt and lap weld galvanized iron pipes have been nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots f.o.b. Pittsburgh:

Lap Welded Steel		*Charcoal Iron*	
3½ to 4½ in.....	40½	1¾ and 1⅞ in.....	+20
2½ to 3¼ in.....	30½	2 and 2¼ in.....	+10
2¼ in.	24	2½ and 2¾ in.....	+1
1¾ to 2 in.....	19½	3 and 3¼ in.....	— 1½
		3½, 4 and 4½ in...	— 8

Standard Commercial Seamless—Cold Drawn or Hot Rolled

	Per Net Ton		Per Net Ton
1 in. $327		1¾ in. $207	
1¼ in. 267		2 to 2½ in..... 177	
1⅜ in. 257		2¾ to 3¾ in..... 167	
1½ in. 207		4 in. 187	
		4½ to 5 in..... 207	

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiations.

Sheets

Prices of the Steel Corporation for mill shipments on sheets of United States standard gage in carloads and larger lots for indefinite delivery are given in the left-hand column. For reasonably prompt delivery, mills have no trouble in getting prices quoted in the right-hand column, or even higher prices.

Blue Annealed—Bessemer

	Cents per lb.
No. 8 and heavier.....	3.50 to 5.95
Nos. 9 and 10 (base).....	3.55 to 6.00
Nos. 11 and 12.....	3.60 to 6.05
Nos. 13 and 14.....	3.65 to 6.10
Nos. 15 and 16.....	3.75 to 6.20

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21.....	4.15 to 6.30
Nos. 22 to 24.....	4.20 to 6.35
Nos. 25 and 26.....	4.25 to 6.40
No. 27	4.30 to 6.45
No. 28 (base).....	4.35 to 6.50
No. 29	4.45 to 6.60
No. 30	4.55 to 6.70

Galvanized Black Sheet Gage—Bessemer

Nos. 10 and 11.....	4.70 to 7.50
Nos. 12 to 14.....	4.80 to 7.60
Nos. 15 and 16.....	4.95 to 7.75
Nos. 17 to 21.....	5.10 to 7.90
Nos. 22 to 24.....	5.25 to 8.05
Nos. 25 and 26.....	5.40 to 8.20
No. 27	5.55 to 8.35
No. 28 (base).....	5.70 to 8.50
No. 29	5.95 to 8.75
No. 30	6.20 to 9.00

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16.....	4.15 to 6.15
Nos. 17 to 21.....	4.20 to 6.20
Nos. 22 to 24.....	4.25 to 6.25
Nos. 25 to 27.....	4.30 to 6.30
No. 28 (base).....	4.35 to 6.35
No. 29	4.40 to 6.40
No. 30	4.40 to 6.40
Nos. 30½ and 31.....	4.45 to 6.45

PERSONAL

Dr. J. E. Stead, F. R. S., the new president of the Iron and Steel Institute, belongs to a distinguished family, his brother being the late W. T. Stead, editor *Review of Reviews*, who was lost at the time of the Titanic disaster. Dr. Stead was born at Howden-on-Tyne, Oct. 17, 1851. Early in his career he was chemist for Bolckow, Vaughan & Co., Ltd., at Gorton Steelworks, Manchester. In 1876 he entered into partnership with his first employer, Mr. Pattinson, at Middlesbrough, as analytical chemists, under the name of Pattinson & Stead. In 1905, Mr. Pattinson retired and Dr. Stead took into partnership his chief assistant, H. Frankland, the name of the firm being retained. He was honored by the Iron and Steel Institute in 1901, receiving the Bessemer medal. He became interested in metallographic research in 1893, and in 1903 the value of his work was recognized by the Royal Society, of which he was elected a fellow. On the visit of the American Institute of Mining Engineers to Great Britain in 1906, Dr. Stead, together with Sir Robert Hadfield, was elected an honorary life member of that institution. He was awarded a gold medal at the recent St. Louis Exhibition for a selection of photomicrographs of metal sections and has a similar award from the Franco-British Exhibition held in London. On the occasion of the visit of the Iron and Steel Institute to Leeds in 1912, the University Court of the Leeds University conferred on him the honorary degree of doctor of science; in 1913 he received the honorary degree of doctor of metallurgy of the University of Sheffield, and in 1914 the honorary degree of doctor of science of the Victoria University of Manchester. For many years he has been a member of the council of the Iron and Steel Institute. His election to the presidency of the institute is a tribute to his researches and contributions to steel metallurgy.

DR. J. E. STEAD

George P. Sonn, formerly with the National Conduit and Cable Co., Inc., and the National Brass and Copper Tube Co., Inc., as mechanical engineer, is now with the Machine Tool Engineering Co., Inc., 149 Broadway, Singer Building, New York, railroad and machine shop tools and equipment, as a special sales representative.

The West Virginia Coal & Coke Co. announces the election of John L. Kemmerer, chairman of the board, and Everett Drennen, president of the company.

Sheldon M. Hird, 991 the Arcade, Cleveland, has started in business as a sales engineer, specializing in hoisting and conveying equipment.

J. L. Ray, formerly manager of the Western Electric Co., Pittsburgh, has been made power apparatus sales manager in the general sales department of the company at New York. W. H. McCrellish has been appointed to succeed Mr. Ray at Pittsburgh.

D. Gleisen, manager industrial bearings division, Hyatt Roller Bearing Co., New York, has appointed W. F. Myer directing transmission engineer.

W. C. Rott, formerly with several large steel companies and prominent designing and constructing engineers, has joined the staff of Barton R. Shover, consulting electrical, iron and steel plant and steam engineer, Oliver Building, Pittsburgh.

George H. Layng, manager of manufacturing of the Cadillac Motor Car Co., Detroit, has been appointed vice-president and director of the company.

Henry G. McComb has relinquished his position as general manager of the Russel motor axle division, McCord Mfg. Co., Detroit, and has resumed his sales engineering and development work at 1790 Broadway, New York.

Harry Brearley, who received the Bessemer medal of the British Iron and Steel Institute for 1920, is an outstanding example of a man who has carved out a splendid career by his own grit and abilities. In Sheffield Mr. Brearley's name is a household word. The Bessemer medallist was born in Sheffield in 1871, and attended school, unwillingly as he says, between the ages of 6 and 10 years. He then did odd jobs in a foundry and a clog factory, and was also a page boy before he started work in a steel-making plant at the age of 12. He studied chemistry at the analyst's bench and later went to an important steel works in Russia as metallurgist for four years. Returning to Sheffield, he established himself as a consulting metallurgist and before the war he had become head of the Brown-Firth Research Laboratories at Sheffield. Shortly after the outbreak of war he became works manager at Brown-Bayley's Steel Works, Ltd., and is also associated with other companies. He was the discoverer of stainless steel and has carried out much valuable research on chrome steel for various purposes, as well as being the inventor of other minor materials and apparatus. He is now intimately associated with the syndicate which is handling the stainless steel inventions all over the world. Mention may be made of his books on "The Heat Treatment of Tool Steel," and "Ingots and Ingot Molds."

HARRY BREARLEY

Guy D. Leopold has resigned as purchasing agent and traffic manager of the Edgewater Steel Co., Pittsburgh, to accept the position of general purchasing agent for the Austin Co., Cleveland. Walter McKean, Westinghouse Electric & Mfg. Co., will succeed Mr. Leopold, and Charles E. Sundstrom will become assistant purchasing agent and traffic manager of the Edgewater Steel Co.

W. C. Coryell has been appointed chief engineer of the General Fireproofing Co., Youngstown, Ohio. He served the Carnegie Steel Co. 12 years at its Youngstown plants, six years as steam engineer, resigning in 1912 to become a consulting engineer. During the war Mr. Coryell was major, in charge of the projectile design in the engineering department of the Ordnance Department at Washington.

N. N. Baad, who formerly had charge of the heat-treating department at the De La Vergne Machine Co., New York, has resigned to accept a position as sales and service engineer with the F. A. Calhoun Co., 76 Montgomery Street, Jersey City, N. J.

Rev. M. J. Prestidge has been elected president of the Dundee Foundry Co., Dundee, Mich.

I. Lamont Hughes has resumed his duties as general superintendent of the Carnegie Steel Co. in the Youngstown district after a severe attack of appendicitis. He recuperated at Cambridge Springs, Pa.

W. H. Geesman, who recently resigned as superintendent of the Brier Hill Steel Co. at Youngstown, Ohio, in charge of blast furnaces, has accepted a position with the Lackawanna Steel Co., Buffalo, in charge of blast furnaces and docks.

W. K. Kenly, former purchasing agent Interstate Iron & Steel Co., Chicago, is now associated with the James S. Miller Co., McCormick Building, Chicago. He is in charge of the new ferroalloys department.

The Cleveland Cliffs Iron Co. has appointed Bernard Johnson permanent agent in Escanaba. He has

been connected with the company for 18 years. He will have charge of the dispatching and loading of vessels belonging to the company that run to and from Escanaba.

E. G. Bauer of the Dayton, Ohio, office of the Biggs-Waterson Co., machinery dealer, Cleveland, has been appointed sales manager of this company's Toledo, Ohio, office.

George Pipoly has resigned from the industrial relations department of the Youngstown Sheet & Tube Co., Youngstown, Ohio, to engage in business at East Youngstown.

Robert H. Watson is now general superintendent of the blast furnaces of the Ford Motor Co. in the River Rouge district, Detroit. He was formerly in the employ of the Detroit Iron & Steel Co., Detroit.

R. J. Mullaly has been advanced from superintendent of plate and jobbing mills of the Brier Hill Steel Co., Youngstown, Ohio, to assistant general manager. He was formerly superintendent of the McDonald, Ohio, bar mills of the Carnegie Steel Co. In his new capacity he is assistant to C. B. Cushwa.

W. H. Warren, formerly general manager Brier Hill Steel Co., Youngstown, Ohio, will spend several months on a trip to California and other western points.

Changes have been made in the organization of the Petroleum Iron Works Co., Sharon, Pa., as follows: J. L. Considine made first vice-president in charge of executive work;. H. A. Bishop, formerly manager of the New York office, is now vice-president in charge of sales, with headquarters at Sharon; G. E. Mittinger, formerly manager of the pressed steel products department of the company, is vice-president in charge of production; F. H. Munkelt, formerly in the sales department at Sharon, is assistant manager in charge of sales in the New York office. Printed statements that this concern is closely affiliated with the Galena Signal Oil Co., a subsidiary of the Standard Oil Co., are incorrect.

R. J. Kaylor, publicity manager Youngstown Sheet & Tube Co., delivered an illustrated lecture May 25 before the Engineers' Club of the Youngstown district, showing the various processes in the making of steel from the mining of ore to the finished product.

The personnel of the Beaver Machine & Tool Co., Newark, N. J., has changed and the officers now are: Ernest B. Slade, president and treasurer; Harold E. Slade, vice-president and secretary; Arthur T. Doud, vice-president and general manager. Wm. Doud, who recently joined the organization, was formerly manager of the press metal division, American Tube & Stamping Co., Bridgeport, Conn. Robert C. Nelson is factory superintendent, and L. M. Moore is tool room superintendent. J. Downing is chief engineer. The company is turning out a line of electrical wiring devices which will shortly be on the market, in addition to specializing in light metal stampings and special machine and tool work.

A. E. Hirsth, formerly with Brier Hill Steel Co., Youngstown, Ohio, has resigned to accept a position with Perin & Marshall, consulting engineers, New York, and will leave soon for India, where he will have charge of the construction of two blast furnaces for the Tata Iron & Steel Co., at Sakchi, India, near Calcutta.

At the regular monthly meeting of the board of directors of Manning, Maxwell & Moore, Inc., May 19, Percy M. Brotherhood, senior vice-president, was appointed executive vice-president, with the powers and duties attaching to the duties of president, succeeding Alfred J. Babcock, resigned on account of ill health. Mr. Brotherhood has been actively associated with Manning, Maxwell & Moore, Inc., for over 25 years, and during recent years has been in charge of the machine tool business of the company. Eugene Maxwell Moore was recently elected vice-president in charge of foreign sales. Henry D. Carlton was elected a director of the corporation, following his recent election to the office of vice-president in charge of the brass goods sales, succeeding the late John N. Derby. Robert A. Bole, Pittsburgh district manager, was elected a director.

Warren C. Webb, sales representative in Chicago, for the American Pulley Co., has been appointed sales representative in Chicago territory by the W. A. Jones Foundry & Machine Co., Chicago. This is in line with the company's purpose to inaugurate a comprehensive sales campaign to market transmission machinery.

A. E. Hirsth, for the past two years identified with the blast furnace department of the Brier Hill Steel Co., Youngstown, Ohio, in an engineering capacity, has accepted a position with Perin & Marshall, consulting engineers of New York. He will be sent to India, where he will have charge of erection of two blast furnaces for the Tata Iron & Steel Co. at Sakchi, near Calcutta. Prior to going to India Mr. Hirsth will make a western trip.

Andrew L. Gath, formerly chief mechanical engineer of the American Manganese Steel Co., Chicago, has accepted a position as assistant superintendent of the Buick plant of the General Motors Corporation at Flint, Mich.

M. R. Koerner, M. S. Little Mfg. Co., Hartford, Conn., brass nuts, offsets, etc., has been made vice-president and general manager A. J. Beaton Mfg. Co., that city, steam and heating supplies.

Dwight E. Clark, foreman Worcester Ornamental Iron Works, Worcester, Mass., has resigned to become superintendent Farmer Iron Works, New Haven, Conn.

The Tin Deposits of Mexico

The failure to realize any successful tin-mining operations in the United States under the war stimulus to the general mining industry, except one inconsiderable operation in South Dakota, renews interest in the possibilities for tin mining in Mexico.

The Mexican tin deposits have been long known. In fact, they were worked in pre-Cortez times and there has been a continuous production on a small scale in various parts of the Republic. However, at no time has the total output of the Mexican tin mines reached any large proportions, and the industrial operations have been on a small scale, and mostly by the Mexicans.

About 25 years ago a Pittsburgh syndicate undertook the development of tin in Durango. The capital raised and expended was large, and the operations for the time were elaborate. This undertaking failed, partly because of the extravagance of the ideas of its backers and certain internal financial features, but chiefly, of course, by reason of the failure to find tin in large commercial quantities. This failure and the publicity it engendered in the United States had a great deal to do with the neglect of the Mexican tin resources by the aggressive North American capital for nearly a quarter of a century after. Perhaps, also, the fact that there was practically no successful tin mining in the United States influenced the trend of American interests in the Mexican tin deposits.

During the later years of the Porfirio Diaz era several serious and reasonably promising attempts to realize these Mexican tin deposits were made. Notable among these were the operations in the western part of the State of Aguas Calientes, in the southern part of the State of Zacatecas, and near San Luis Potosi. Other promising but less accessible deposits, on the border of Durango and Zacatecas and in the South of Mexico, were controlled with the view of later developments.

It is known that the results of the limited explorations which had been done on some of the more promising of these Mexican tin deposits had been favorably reported on by engineers from the United States and serious operations planned.

It is expected that the resumption of mining in Mexico will result in a continuation of these operations and probably in the inauguration of new ones. Well-posted authorities express the opinion that tin mining in Mexico will be a successful branch of the industry. Considering the widespread occurrence of tin as reported ore, it is also to be expected that tin mining will not be confined to a single locality.

OBITUARY

JAMES SCOTT, aged 70, who had a national reputation as a blast furnace operating expert, and was called the dean of superintendents of the Carnegie Steel Co., died at his home in the East End, Pittsburgh, on Wednesday, May 19. He was born in Dalkeith, Scotland, and came to the United States in 1872. After living in the East a short time, he went to Pittsburgh and became one of the early associates of Andrew Carnegie in the steel business. He entered the employ of the company at the Lucy furnaces on Jan. 1, 1877, and continued in that work for many years, being advanced through various grades until he became general superintendent of the Lucy, Isabella, Edith and Neville furnaces. When he retired, Dec. 31, 1912, after 36 years continuous service with the company, he was the oldest superintendent in point of service. He was a member of the Carnegie Veterans' Association, which was formed of the younger partners of Andrew Carnegie in the business, the American Iron and Steel Institute, the Engineers' Society of Western Pennsylvania, the Duquesne Club, St. Andrew's Society, and the Masonic fraternity.

JAMES SCOTT

OSCAR BRUCE BANNISTER, president Muncie Wheel Co., Muncie, Ind., died May 12, of heart disease. In 1889 he was appointed manager of the American Wheel Works, Jackson, Mich., later organizing the National Wheel Co. there. In 1893 he went to Muncie.

WILLIAM E. COLLIER, vice-president, general manager and a member of the board of directors of the Campbell, Wyant & Cannon Foundry Co., Muskegon, Mich., died recently as the result of injuries received in an automobile accident. Born in England 45 years ago, Mr. Collier came to the United States when five years old. He entered the employ of the foundry company several years ago as a mechanical engineer.

DWIGHT H. COBLE, secretary of the H. C. Frick Coke Co., Pittsburgh, died of pneumonia Sunday afternoon, May 23, in his home in the East End in that city, only a little more than a week after the death of his only son, Dwight S. Coble, 16 years old, who was stricken with the same malady. Weakened by the constant vigil at his son's bedside, Mr. Coble took seriously ill last Monday. He was born in Steubenville, Ohio, July 20, 1874, and had been associated with various organizations of the United States Steel Corporation since 1896, when he went to Pittsburgh and was associated with A. M Moreland. Subsequently, he went to New York and in 1890 became private secretary to the late James Gayley, then one of the vice-presidents of the United States Steel Corporation, and in 1902, returned to Pittsburgh to go with the H. C. Frick Coke Co. Mr. Coble was a graduate of the Lawrenceville Preparatory School, Lawrenceville, N. J., and entered Princeton University with the class of '98, but left the University before graduating. He was a member of the Masonic fraternity, the Duquesne Club and the Pittsburgh Athletic Association. He is survived by his wife.

DWIGHT H. COBLE

RAILROAD EQUIPMENT

Hearings Before the Interstate Commerce Commission as to Needs

WASHINGTON, May 25.—Hearings will be begun on May 29 before the Interstate Commerce Commission relative to the use of the $300,000,000 fund provided under the transportation act for loans to carriers. The commission has announced that at least $125,000,000 of this amount will be allowed for purchase of equipment. The commission points out that this sum is less than 25 per cent of the amount needed by the roads for the purchase of equipment not yet ordered. This is on the basis of a minimum need as estimated by the commission of 2000 locomotives and 100,000 freight cars, including 20,000 refrigerator cars. It is urged that the carriers assume the burden of financing the other 75 per cent and that a national equipment corporation be formed in which the carriers would take stock for 25 per cent of the cost of the equipment, the United States advancing the cash for the stock up to $125,000,000 and the remaining 75 per cent being financed through a car trust.

In the event that such an equipment corporation cannot be organized, the commission suggests that the fund should be distributed to those carriers who individually can meet the Government's advance with large proportional amounts financed by themselves.

It is stated by the commission that loans should not be granted for additions and betterments unless it be clearly demonstrated that these improvements will facilitate materially the movement of equipment.

The commission states that one of the most pressing needs is for refrigerator cars for the movement of perishable foodstuffs and that other very pressing needs are for other freight train cars and for locomotives.

Massachusetts to Have Machinery Accident Prevention Code

The Department of Labor and Industry of Massachusetts has appointed a special commission which will make investigations and upon their results base a code of prevention against accident from woodworking machinery. The commission contains two representatives of employees, who are John F. Tinsley, general manager of the Crompton & Knowles Loom Works, and Albert B. Bemis, pattern maker, both of Worcester; two representatives of labor unions, and one representative each of the liability insurance companies, the Associated Industries of Massachusetts, and manufacturers of woodworking machinery. Statistics show that in the year ending June 30, 1919, Massachusetts had 1515 accidents from woodworking machinery, of which 12 were fatal, one produced permanent total disability and 229 permanent partial disability.

The New England Metallurgical Corporation, Boston, has taken a Massachusetts charter to engage in commercial heat treating of steel and to act as consulting metallurgical experts. The company is capitalized for $100,000, consisting of 500 shares of common stock, par $100, of which 497 are issued against patent rights and three against cash, and 500 shares of preferred stock, par $100, all issued against cash. Wheaton B. Byers, 985 Charles River Road, Chambridge, is president, and W. Louis Williams, 18 Powder House Boulevard, Somerville, is treasurer. They and Howard W. Lang, Boston, Harold V. Tillson, Brockton, and Clifford H. Byrnes, North Cohasset, constitute the board of directors.

The F. W. McArdle Engineering Co., Boston, has been incorporated to acquire the engineering business of Fred W. McArdle, 101 Tremont St. William E. Cunningham, Somerville, Mass., is president, and Mr. McArdle is treasurer.

IMPROVED CONDITIONS

More Active Capacity in Youngstown District—Mill Yards Clogged

YOUNGSTOWN, OHIO, May 24.—Impetus was given steel production in the Mahoning Valley to-day when finishing departments of the leading producers, partially suspended for five weeks, resumed on larger schedules. It is estimated about 3000 men returned to work. Twelve of 25 blast furnaces are pouring, the active stacks being Mary furnace of the Sharon Steel Hoop Co. at Lowellville; Anna furnace of the Struthers Furnace Co. at Struthers; Mattie furnace of the A. M. Byers Co. at Girard; Grace and Tod of the Brier Hill Steel Co.; three stacks at the Ohio Works of the Carnegie Steel Co.; two furnaces in the East Youngstown battery of the Youngstown Sheet & Tube Co. and two in the Haselton group of the Republic Iron & Steel Co. Indications are that the Sheet & Tube and Brier Hill companies will start banked furnaces this week.

At its Girard works, the A. M. Byers Co. is operating 44 puddling furnaces and one skelp mill.

The Bessemer plant of the Republic company started Sunday evening on the midnight turn. Monday morning, in the Brown-Bonnell Works, four finishing mills, 10-in. and 20-in. skelp mills, and 7-in. and 8-in. bar mills resumed, affording employment to over 1000 workers. In addition, the company is operating 13 open-hearth furnaces and its plate mill.

The Sharon Steel Hoop Co. started its hot mills at Hazleton Monday, after a week's idleness.

More extensive operations were announced by the Trumbull Steel Co. All seven open-hearth furnaces, blooming and bar mills, hot and cold-strip mills, and six sheet and six tin mills are active. The Liberty tin-mill plant is on in full, though output is curtailed.

Some slight accessions were made this week by the Brier Hill Steel Co. and Youngstown Sheet & Tube Co. It is explained that continued operation of additional units is wholly dependent upon movement of coal and will cease unless the fuel supply is maintained.

In the Shenango Valley, No. 3 blast furnace of the Shenango Furnace Co. at Sharpsville, Pa., is again active. Lifting of embargoes has enabled other plants to announce more ambitious schedules.

Heavy accumulated tonnage of finished steel is still clogging mill yards, though large tonnages have been moved in the past 10 days in train lots. Some steel has been shipped to urgent consumers in Detroit from this territory in trucks in better time than the railroads would have delivered the material under ordinary conditions.

To Improve Railroad Service

At the instigation of the car service section of the American Railway Association, a meeting was held May 24 to organize the operating departments of the railroads for joint control. By this arrangement the railroads will be operated in practically the same manner as under Government control during the war. A committee made up of representatives of the Interstate Commerce Commission, the National Industrial Traffic League and the railroads will be clothed with authority to handle all matters relating to car service and transportation. Similar joint action is being perfected in other industrial centers which have been disorganized by the strike.

The purpose is to aid in the following activities—1. Obtaining prompt loading and unloading of equipment. 2. Loading of cars to full visible or carrying capacity. 3. Placement of car orders in accordance with necessities. 4. Reduction of use of equipment in trap or transfer service when movement can be made by motor or wagon. 5. Development of practical arrangements for expediting through merchandise cars. 6. Such other items of operation and transportation in the interests of car service and promoting increase in available equipment.

There is a growing feeling in influential steel circles that the strike has passed the crest of its disorganizing effects and that conditions will slowly improve.

Difficult to Move Trains

Difficulties have been experienced in getting full trains, made up in mill yards, out of the plants, as the railroads, with their present organizations, are unable to get them to destination. Trains holding large tonnages have stood a week before movement. All cars that can be brought into the plants are being loaded and turned over to the railroads, this process relieving internal congestion to some degree. Lack of box cars is a big deterrent, however, in movement of some grades of finished stock.

The leading pipe maker is sold up for the rest of the year and is considering only exceptionally attractive specifications.

Sheet production still approximates 50 per cent of capacity. Makers have as yet experienced no labor shortage because of the low operating rate. If conditions were normal, though, and the mills were producing 100 per cent, there would be some difficulty in assembling full crews for all turns. Demand from the trade continues active. The principal new business is being transacted by jobbers, who report that they have no difficulty in clearing stocks.

Both plate mills of the Brier Hill Steel Co. are engaged in production, and all district plate makers report brisk demand, which they are unable at present to fill. The semi-finished market remains inactive.

Conditions are still sluggish in the scrap metals field, quotations yielding to lessened demand.

Bookings by independent mills for black sheets have been at 7c. to 7.50c., for galvanized 8c. to 8.50c. and for blue annealed 5c. to 5.50c. Price inducements are still held out for delivery considerations by the automobile industry.

City of Superior Urges Speedy Decision on Pittsburgh Basing Point

The Civic and Commerce Association of Superior, Wis., has just sent a resolution to the Federal Trade Commission, urging an announcement in the Pittsburgh basing case. It calls attention to the fact that on July 1, 1919, it filed with the commission an application for a complaint against the United States Steel Corporation and others, looking to the abolition of the Pittsburgh basing point for steel. Numerous other applications for a complaint were filed practically simultaneously, it says. A preliminary hearing was held by the commission the week of Dec. 2, 1919.

The resolution asserts: That the practice of the Pittsburgh basing point is costing the American public millions of dollars a month; that sufficient facts were brought out at the preliminary hearing to prove that the practice is contrary to law; that parties interested have not been permitted to submit their evidence; that applications for complaints under the trade law should be determined by the commission upon preliminary hearings at which all parties are represented and that such a hearing was had and an exhaustive record made; that five and a half months is an unreasonable length of time for a review of such a record, and a determination thereon; that extended delay in making a decision increases the losses of the public and private interests affected; the impending increases in freight will materially increase the arbitrary surcharge and render prompt relief imperative.

The resolution further maintains that the delay in announcing the decision by the Federal Trade Commission is promotive of unrest, suspicion and discontent, especially in view of the fact that a prompt decision was expected by the public generally, because of the numerous statements to that effect by members of the commission.

The Standard Tank Car Co., Sharon, Pa., recently made a shipment from its works of what is said to be the longest train of tank cars ever sent out. The train was routed to the Texas oil fields and consisted of 123 cars, being over a mile in length.

CORRESPONDENCE

Let's Fire the Blueprint

To the Editor: It must be now about forty-five years since I first "caught on" to the use of the blueprint, and at the time, like everybody else, I thought it a great acquisition. As things go in the industrial world it is quite astonishing how little has developed in blueprint practice in the way of substantial improvement, and this notwithstanding that in many particulars the blueprint has always been and still is far from satisfactory for the purposes it is made to serve.

We don't need to be told about this. The blue surface and the white lines are both objectionable, but are accepted with tacit protest as unavoidable. Lines too fine will not print and lines too close together blur each other in the printing. Of blueprints with which we are too familiar in business, some are good, some are not so good, some are bad; few are perfect in all particulars, so that no one regards blueprints as a whole with any respect or thinks of handling them with care or taking special pains to keep them smooth and clean.

The blueprint when it came was accepted at once as a comparatively cheap and handy means of repetitively reproducing working drawings for shop or other use while retaining the originals intact for record and reference. This has retroacted, so that now we generally have no finished drawings, and the tracing has the double responsibility of serving as the only record and standard in the office and also as the means of blueprint reproduction.

The tracing as the office record has many disadvantages as compared with the stiff, opaque, white paper drawing. It curls up at the edges and corners, catches grease and dirt, and shows at once all the defilements on both sides of the sheet; if filed in a drawer it can never be consulted where it lies on account of the markings on the sheet which lies under it, so that it must always be lifted out and placed upon a blank background, which leads to its rapid deterioration from the mere handling.

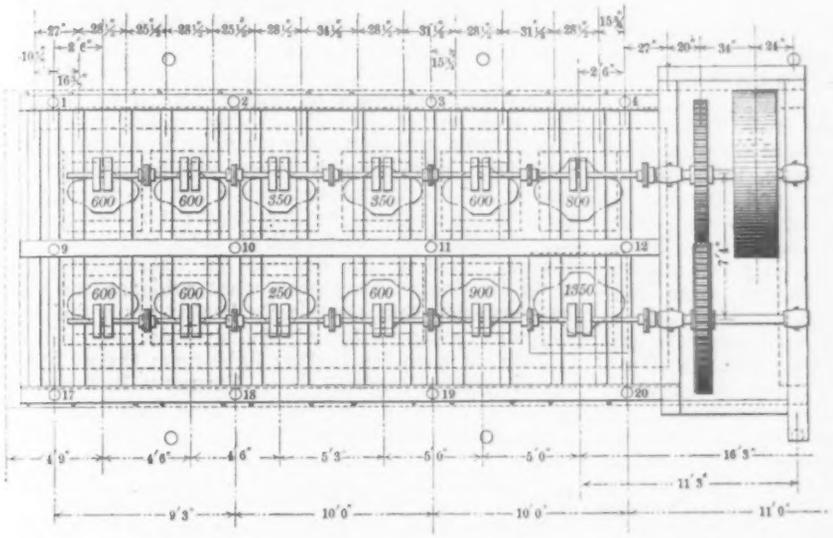
As a reproductive device the blueprint, with its tracing, is far behind the times, in that it permits only the one size of print instead of any size or scale that might be desired. The tracing also, as compared with the drawing on paper, permits no changes when once it is completed. Slight erasures or alterations require great skill and care, and it is almost impossible to prevent the result from disfiguring the print when made.

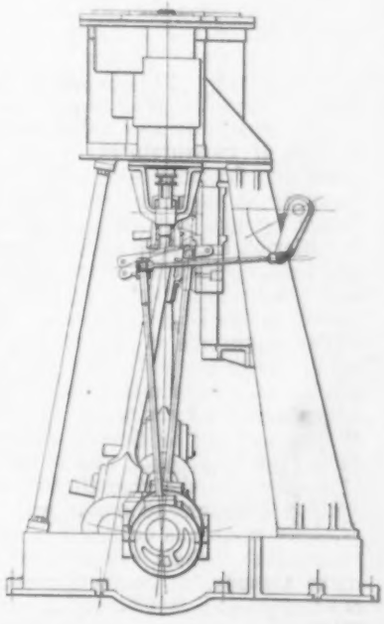
The way out of this difficulty suggests itself. Line cuts which are continually appearing in technical publications of the day in connection with the printed articles, show some machine, or some detail of a machine, or some mechanical combination which is being explained, precisely at it would appear, and generally as it has already appeared, in blueprint form.

Take, for instance, the accompanying illustrations reproduced from papers many years old. From the end elevation of an old marine engine, we can roughly guess the dimensions of the original blueprint. Say that it was only 30 in. high with 19 in. for the base, while a rectangle 5 in. by 3 in. would entirely inclose the cut here presented, making the relative areas of blueprint and line cut 38 to 1. Every line is reproduced clean and sharp, black upon white as it should be, the heavy lines giving the shade effect impossible with the white lines of the blueprint.

The other illustration represents finer line work, but still every line is perfect and has its proper value. Here also the shade line effect is beautifully brought out. This cut has an unusual number of figured dimensions, all of which are perfectly legible. If the original drawing had been made with the purpose in view of illustrating the present article, the dimension figures might have been written so that they would have been still more easily legible.

It is to be noted that each of these cuts as here presented is smaller in both dimensions than the standard post-card, 3¼ by 5½ in. Does not the suggestion inevitably force itself upon us that, in at least three-quarters of all the cases in which a blueprint is employed, an engraved and printed post-card would serve the purpose vastly better?





The average reader who has given the matter no thought will jump up at once with the objection that the scheme is impracticable on account of the expense involved. Not long ago I accumulated data sufficient to show me that zinc process cuts of line engravings of any size within the post-card dimensions could be produced for one dollar each and delivered within twenty-four hours. The making of the cut would be the only expense involved. When it came to the production of copies in any number, from one upward, the cost of each post-card would be, say, one per cent of the cost of the blueprint which it superseded.

If we may assume the scheme here suggested to have been adopted and completely in operation in some enterprising establishment, we will find it worth while to note how everything is at once simplified. The tracings and the blueprints, and everything connected with the producing and storing of them, have all disappeared. Instead we have the standard drawings perfectly inked in and finished, and orderly placed and kept in their proper drawers, and besides these master drawings there would be the drawers containing the post-card copies of the drawings kept like any other cards and always instantly accessible.

The post-card size is merely a tentative assumption. The dimensions might be successively doubled, as 3¼

by 5½; 5½ by 6½; 6½ by 11; 11 by 13, and still the area would be less than one square foot. One of these sizes might be adopted for the drawings too large for reproduction on a post-card, but if the post-card size, or its equivalent, were adopted for the great majority of the work, the problem of the larger sizes would ultimately settle itself, and not by the retention of the blueprint. FRANK RICHARDS.

229 West 135th Street, New York.

High Cost of Metric Changes Illustrated

To the Editor.—If the plan now so widely advocated by the so-called World Trade Club of San Francisco of forcing the metric system on the people of this country, making it illegal to measure and weigh in inches, feet, pounds and quarts, should become a law, it would cost the manufacturers of this country millions upon millions of dollars to incorporate such a change. It would result in untold confusion on account of having two systems in use instead of one, as it would practically be impossible to abandon the old system even if the new were forced on the country. It would also throw us out of uniformity with the other great English speaking peoples of the world who now use the inch and foot as a basis of measurement.

It would seem that this country as powerful as it is should be in a better position to dictate as to the standard rather than the foreign countries, especially as this would present a united front on the part of all English speaking peoples.

The writer had occasion to make a change in the system of measurements while connected with the American Locomotive Co. at Providence, R. I., manufacturer of the Alco pleasure car and truck. In launching into automobile engineering they took over the Bleriot, a French product, using the metric system and incorporated the latter in their own pleasure cars and trucks but finally decided to change from the metric to the English system. To give you some idea of the magnitude of the expense, if my memory serves me correctly the tools, jigs and fixtures for this alteration cost approximately $90,000. It means carrying a double set of tools, as it would be hazardous to change any jig or fixture and not practical to make them interchangeable, and it surely runs up into a lot of money. If the changing of tools for a single car costs this amount of money, a little idea can be formed of the tremendous outlay it would mean to the industries of the whole country. It is only necessary to make a study of the facts in the case to be strongly opposed to any legislation which would overthrow our established standards of weights and measures.

DEPENDABLE TRUCK & TRACTOR CO.,
C. V. Morse, president and general manager.

Baking Steel Wire in Ovens

To the Editor:—On page 1169 of your issue of April 22 appears an article entitled "Baking Steel Wire in Ovens," which is interesting but misleading.

A casual reading of the figures and text leaves one with the impression that for the baking of steel wire in wire drawing plants electricity is cheaper than the fuels heretofore employed. An analysis of the figures and text show that the reverse is true.

The operation described as "drying off grease and oil" cannot be identified by the writer as a normal wire mill process. We are chiefly interested, however, in the author's conclusion, which is that electricity is cheaper than the fuels ordinarily employed for baking wire, except in one case, namely, the baking of wire, at maximum capacity of the oven, to remove the danger of acid brittleness. The author has failed to state that 98 per cent of baking operations conducted in the wire mill fall into this class.

The author explains further that these figures "take no count of increased perfection, and duplication of results of the finished product due to the perfect temperature control, whereby the operating temperature can be quickly changed when desired." The writer has spent much time in wire mills and has figured on the specifications of many wire mill superintendents for baking equipment, but has never been asked to provide for quick changes of temperature, nor been advised that "increased perfection" would result therefrom.

The author calls our attention to the possible interruption in the operation of the ordinary baker due to inability to secure fuel. This is a standard talking point for electricity and frequently a good one. In point of fact, steam is indispensable for heating the acid in the wire mill cleaning house. If fuel is not obtainable for the baker, neither is it obtainable for the purpose of raising steam. If no wire is being cleaned, there need be no baking.

The clinching argument appears in the last paragraph, in which we learn that the use of electricity has "not only increased the capacity of the ovens, but produced finished work with no rejections." The premises from which these conclusions are drawn do not appear in the text. Wire is dried and baked by hot air (literally). In a well designed baker, fresh air entering at the bottom is heated by contact with something hot, whether it be resistance wires, steam pipes, or metal flues heated from the inside by any of the fuels commonly employed, and passes upward through the coils of wire. Does the author claim that a temperature suitable for the rapid baking of wire cannot be readily obtained by the use of ordinary fuels? If so, the writer will take issue with him on this point. Or is there some quality in electric heat which is not present in the heat of plebian origin?

An interesting field of speculation is opened up by the author's reference to the production of "finished wire with no rejections." If electric baking has this happy result, the wattmeter may tick away the kw.-hr. unheeded. Wire men, however, would appreciate an account of the inspection system by which responsibility for defects appearing in the finished product may infallibly be traced back through countless operations and laid at the door of the baking oven, and would be glad to hear upon what evidence one bases the conclusion that electrically heated air would have done what ordinary hot air failed to do.

May we hope for further light from the author on this interesting subject? KENNETH B. LEWIS.
Manager of Sales, Morgan Construction Co.,
Worcester, Mass.

How to Prevent Disaster

To the Editor:—If there was ever a time in the history of our nation that our most thoughtful consideration should be given for its welfare, *that time is right now.* The spirit of unrest, of selfishness, of profiteering and hoggishness throughout the nation, I predict before 12 months is past will put the people of our country on a bread line, unless something is done and done quickly to prevent it.

I believe that God never intended that man, woman or child should be slaves or fools; He has provided us with the earth, all things therein and above; He has also provided us with a brain. Let us use that brain, and you will find beyond a doubt that His way is a square deal for us all. Therefore, may all the godly love within your hearts bring forth the patriotism of your full manhood as never before, and say *by the help of God these conditions shall not come.*

If they come, rich and poor alike will stand in line. Your pockets may be lined with money, but it will avail you nothing while you beg for something to eat. It may even now be too late to avoid it; our brainless business methods of false, high values on the commodities of life, and our brainless folly of higher wages to catch up to these false, high values, instead of lowering the values of the commodities of life, have taken all of 50 per cent of the farmer's help to the cities, to get into the game for some of the apparent easy money, and unless the farmers of the country can get sufficient help, and that quickly, at a reasonable price, you will see the bread line before long.

To help avoid this we must cut out our brainless methods of building business on a foundation of sand and put business on a solid foundation of common sense. First, by cutting out *time and a half for overtime; it* will, unless it is cut out, do more to disrupt

this country and its people than a dozen wars; it has done more harm financially than the war with Germany; it is a robber and the worst enemy the workingman or any other man ever had to contend with. It creates a gamble and false value on everything it touches, and its cousins, namely, *bonus* and *cost plus basis*, are no better; none of them belong to sound business. *Time and a half for overtime daily* puts millions of dollars into the pockets of those not deserving it, to the detriment of those it was intended to benefit.

Bonuses, like time and a half, are unsound as a business principle; it would appear, as long as we could *hog* it, get a profiteering profit, we will pay you a bonus. It is better to pay the employee as decent a wage as the job will bear, cut out the bonuses, and exact 100 per cent efficiency from the employees in the manly way.

Cost plus basis has been another robber; it is a *cowardly business*. When you look it squarely in the eye, for a business man to put the responsibility of turning out the work on his customer, who knows nothing about such work, it is *bad business*.

I am convinced, beyond a doubt, that a man will enjoy better health, do more work on the 8-hr. basis, the year round, than he will on the 10-hr. basis, if he is an honest worker, and I believe that man's wages should be sufficient to allow him and his family to live decently and be able to save for a rainy day.

Also, I believe in a union of every trade, branch or department by itself, and would glory in the Americanism of men to get a decent wage up to the point that the industry will honestly bear. Some lines of work will command a higher wage than others; in some work piece work prevails or fits, and in other work time work prevails or fits. Work the wage out on the 48-hr. basis, demand 100 cents on the dollar in your pay envelope, and see that the boss gets his 100 per cent efficiency on the 48-hr. work, and everybody will be happy.

For a reconstruction and to avoid the bread line, let us be good Americans, and call special meetings at once of our union, our merchants, manufacturers and business organizations, *and cut out this pest* and all semblance of war profits, and get down to common sense business, and you will see our dollar increase in value.

JOHN C. CAMPBELL.

Newark, N. J.

What Is a Dividend?

To the Editor: The dictionary tells us that a dividend is "a sum of money or quantity of commodities to be divided and distributed—a distributive sum, share or percentage." The definition is limited by inference to that which a stockholder, for example, receives, but back of it all is the fundamental proposition that a dividend is something received as a return upon something else which has been invested.

The manufacturing industry of to-day is made up of three elements, no two of which can spell success without the third. These are Capital, which is the stockholder; Labor, which is the workman, and Management, which is the executive.

The stockholders invest their money, representing something which has been acquired and ask the management to so administer the investment that, at stated times, they shall receive a share of what that invested money has earned. The stockholders elect from among themselves a board of directors to safeguard their interests. This board is the connecting link between Capital and Management.

In case of dissatisfaction with things the stockholders do not move en masse against the management or withdraw their capital without notice and leave the corporation stranded financially. To do so would only cut off income and as a result accumulated capital would be drawn upon to sustain life itself. Adjustment of the evil is attained through the board of directors acting in conjunction with the management.

Labor fails to see that exactly the same laws apply to itself. The workmen invest their skill and time. For the one, they expect a return in the shape of wages, and for the other, comfortable working conditions. Management must administer the workmen's skill and time and the stockholders' money, with the same amount of consideration for returns upon investment. For Management to play fast and loose with either type of investment which has been intrusted to it would be suicide as, sooner or later, both Capital and Labor would withdraw their support.

At this point, however, Labor, unlike Capital, either moves against the Management en masse by violent agitation, or withdraws completely that which it has invested i. e. skill and time, and has to spend whatever it has accumulated to maintain existence.

The failure of the workman to feel at ease in his relations with the management is that, unlike the stockholder, he has chosen his representatives from the outside. These outsiders have no real interest in Labor or Management. It would make no difference to them if dividends were stopped or if the management was handicapped. So the business agent loses nothing when the workman's pay envelope is flat or the management is unable to keep employed those who still desire to secure a return upon their invested skill and time.

The workman must learn to beware the professional organizer, even as the stockholder has learned to discount the habitual injunction seeker, and be represented from within in exactly the same manner as the stockholder. The management is simply a means to an end and has even a selfish interest in assuring dividends to both Capital and Labor for its existence is dependent upon its success in securing for the one, a return upon money invested and for the other, an adequate wage and congenial working conditions for skill and time invested.

In its turn, however, Management has the right to insist that the representatives of both Capital and Labor with whom it deals shall be chosen from those interested and have just as much at stake.

A. D. MURPHY.

Medford Hillside, Mass.

Consolidation of Manufacturers of Agricultural Machinery

An important consolidation of manufacturers of agricultural machinery and tools has been effected and Bateman & Companies, Inc., has been organized with capital stock of $4,000,000. Included in the merger are the Bateman Mfg. Co., Grenloch, N. J.; the McWhorter Mfg. Co., Riverton, N. J.; Duane H. Nash, Inc., Millington, N. J.; the Cutaway Harrow Co., Higganum, Conn.; the Belcher & Taylor Agricultural Tool Co., Chicopee, Mass.; the Bateman-Wilkinson Co., Toronto, the Canadian branch of the Bateman Mfg. Co., and the Richardson Mfg. Co., Worcester, Mass. The officers comprise: President, F. H. Bateman, Grenloch, N. J.; treasurer, F. J. Hillman, Springfield, Mass.; directors, John D. Curtis, Worcester, Mass.; Frank S. Taylor, Chicopee, Mass.; Elmer S. Hubbard, Higganum, Conn.; Frank Bateman, Grenloch; Frederick N. Taff, Millington, N. J.; Frank B. Bateman, Grenloch; W. A. Hendrickson, Riverton, N. J., and Arthur S. Ford, New York.

Philip N. Curtis, general manager of the Richardson Mfg. Co., will be general sales director, with headquarters in New York.

The purpose of the consolidation is to produce a greater degree of efficiency and economy in manufacturing and selling. The combined line will be a very much broader one than that of any one of the units of the merger. The various types of equipment will be assigned among the present factories, all of which will be retained, so that each will have fewer varieties of product, thus permitting a greater degree of specialization. All products will be handled through a single selling force, with transfer houses at the various factories and elsewhere equipment from all the plants will be gathered together, thus permitting shipments of complete orders in one lot.

The Wright Mfg. Co., Lisbon, Ohio, has begun the erection of a foundry and forge to produce castings for hoists, trolleys, cranes and other lifting equipment which it manufactures.

Not Stampeded by Price-Cutting Policy

(*Continued from page* 1525)

in sight, it is difficult to believe that the wheels of commerce are to slow down in the near future."

Mill and factory representatives with whom one comes in contact, he said, refuse to consider the idea of lower prices this year and are urging buyers to get goods whenever possible. A dealer must have stock in order to carry on business, and according to Mr. Nicklis people are liable to be misguided by suggestions of lower prices.

Cost of Business Has Increased in the South

The Southern supplies and machinery business is in a prosperous condition, according to W. P. Simpson, president Southern Supply and Machinery Dealers' Association, who in his opening address stated that 1920 so far shows an average increase in volume of sales of 25 per cent and upwards, as compared with 1919. But the cost of doing business has increased at the same time, so that with a larger volume of sales he expressed himself as certain that ultimate results will illustrate that the Southern distributor is only asking a fair and equitable margin of profit, that the distributors never have endeavored to secure abnormal prices due to extreme shortage of certain classes of material.

Mr. Simpson pointed out that there was a dangerous element in such a conservative policy as has been followed by the distributors. "With rising costs of distribution and only a normal net profit remaining, we must now, as never before, become thoroughly familiar with the detailed expense of operation."

Must Guard Against Depression

"If you are not doing so, you must put in systems of cost accounting that will give you this information each month on a detailed basis." Believing that the high peak of prices has been reached, he expressed the hope that all association members work toward a gradual decline, but impress upon themselves and upon manufacturers that the decline, when it comes, should be orderly—this to prevent a serious business upheaval. Therefore, with declining prices and heavy expenses, including taxes, the cost of doing business will decrease in proportion to sales, and if accurate costs are not known, it may mean serious trouble for those concerns which have not put their houses in order, according to Mr. Simpson's deductions.

He recommended a closer analysis of business than ever before, saying that this policy will assist if there is no trouble and may save if there is. He also recommended that distributors order goods sufficiently in advance, taking into consideration delays in transportation, etc., so that the normal amounts will be on hand and stocks as well assorted as is possible. "This recommendation," he said, "is based on the fact that more profit will be made on the turnover than you probably will lose, due to the eventual decline in values." In adopting such a business policy, he urged the establishment by individual distributors of a reserve account to which merchandise declines can later be charged, thus avoiding a decrease in capital or supply as shown on one's books.

Impairment of Credit

Continuing along these lines, Mr. Simpson said: "A future decrease in capital or surplus figures on your later financial statements will reduce your rating and possibly impair your credit, which, of course, must be avoided. I want to make it clear that I am opposed to carrying excess stocks for speculative purposes, as in my opinion this plan is now dangerous."

In regard to general living conditions and social unrest throughout the country, Mr. Simpson stated he believed the latter was largely due to world-wide propaganda which was intended to convey socialistic ideas to the vast body of labor; to destroy law and order in an endeavor to overthrow the Government. "It is mistaken by labor as an endeavor to assist their living conditions," but Mr. Simpson believes, to a limited extent, that labor has partly recognized this movement and is awakening to the fact it will soon be in a struggle for very existence unless it stands shoulder to shoulder with capital in arresting this dangerous element.

Must Show Labor the Way

"To fully awaken labor, all business organizations, all business men, both collectively and individually, should use every means at their disposal to counteract the propaganda being conducted by the enemies of the country.

"We must enlighten our workmen throughout the country to this danger, we must endeavor to convince them that capital is not antagonistic to labor and that capital and labor have mutual interests in working together to strangle the 'red' ideas certain factions are struggling to impose on the Government."

Increased production is necessary to bring about normal conditions, and Mr. Simpson is of the opinion that workmen should be taught sound doctrines in a clear way.

Labor Leaders Behind Cloak of Radicalism

The three associations held one joint session, all others being of individual executive nature. At the joint session, J. D. Nicklis, president National Association, presided. At this session, William H. Barr, Lumen Bearing Co., Buffalo, and president of the National Founders' Association, in discussing Industry and Labor charged the labor leaders with hiding behind the cloak of the radical union members. He said that "every great strike in recent months has been called an outlaw strike. The coal miners' strike was disavowed by certain leaders. So was the steel strike, and so is the railroad strike. There is an object in these diavowals which is unmistakable.

"The unpopularity of the strikes and the resentment of the public were quickly apparent. Certain union leaders tried to avoid criticism by publicly proclaiming their antagonism, forgetting it was known that they were trying to carry water on both shoulders. The position of union labor to-day is that they have created public antagonism, but, unfortunately, they still retain their political associations, through the threat of reprisal at the polls.

"If you have followed developments in legislation and in industry for the past few years, you will know that whatever power labor has possessed through the unions has come from political alliances. The power of the labor union vote is negligible, but it is advertised with drums and threats, and accordingly it has assumed a real entity for the average politician, whose business in life is counting votes before and after election. I do not ascribe venality to any of our public men, but I do ascribe weakness to many, which is almost as sinister, because the pliable legislator is difficult to locate and to handle. Unless we get back to the constitution and a proper understanding of its principles, there are dark days ahead for industry."

Mr. Barr also took issue with the labor leaders and unions in their stand against legislation tending to modify our existing immigration laws, especially as they apply to the literacy test. He declared that just so long as a shortage of labor can be maintained in the United States the power of the unions will grow, and that power is a sinister and a dangerous one. Under the literacy test the honest worker, who cannot write

an article for a radical sheet, is sent home, while the well-educated scribbler is welcomed and turned loose in the community. "This country," he said, "is suffering from the over-regulation of business, the under-regulation of labor unions, and the indiscriminate attempts of politicians to utilize classes to foster their own political ambitions."

He spoke, however, in favor of business being operated under limited direction of the Government, with sane restrictions, for this would be better than to see it degenerate into a condition where it would attempt to set up its own standards, irrespective of the rights of the public. "The business man is haled before somebody for an alleged and ofttimes imaginary infraction of the law. The labor unions, on the other hand, disturb industry; they can tie up the railroads, the coal mines, the steel mills, the express companies; they can freeze you or starve you, but the Government does not regulate, restrict or control union labor.

"Is it not our duty, therefore, to urge that the unions must be put in a position where they will be responsible to the people, to the courts, to the Government? Until that time comes, we shall have a class autocracy attempting to dominate industry, and clearly dominating politics and the industrial welfare of the country. It is our duty to see to it that a Congress and an executive are elected who will deal equitably with business, with labor and with the American public."

Motor Truck Important Now

W. P. Simpson, president of the Southern Association, gave an illuminating and interesting talk on The South as It is, at this joint session. He contrasted the reconstruction days of the South following the Civil War with that of Europe to-day, and the rise of the South to its financial, industrial, mineral and agricultural position to-day, which is far above any previously enjoyed.

A paper on the Present Conditions in the Rubber Industry, prepared by W. O. Rutherford, vice-president B. F. Goodrich Rubber Co., Akron, Ohio, was read and was especially interesting at this time inasmuch as it treated largely with the position occupied by the motor truck brought about by the railroad transportation situation. He admitted, however, that efficient function of the motor truck depended very largely on good roads, which are lacking, and one of the main features of the paper was an appeal for better roads.

Changed Conditions and Better Opportunities

Changed Conditions in the Supply Trade and Our Better Opportunities for Service, an address delivered by George Punchta, president Queen City Supply Co., Cincinnati, in the morning session of the National Association, was repeated by him upon request at this joint session. As Mr. Punchta pointed out, manufacturers have made strides in placing their production on a scientific basis by the application of cost systems.

Progress made in determining selling costs has been less marked, however, due in a large measure to the manufacturers' irregular attitude as regards differentials allowed jobbing or distributing houses. He believes that many manufacturers now realize the necessity of larger differentials for distribution, especially so during and since the war, because of the Government's attitude toward the distributors. "The war has proven that the consumer can best be served by the dealer." Continuing he said:

"Manufacturers must have a profit on their production. To this an additional percentage for selling is essential, whether it be for the manufacturer or the dealer. Experience has proven that in most cases the dealer can distribute for less than the manufacturer. The consumer gets prompter service from the dealer, whose stock of goods is nearer to him, and from present congested and inadequate transportation conditions, the consumer will have this advantage indefinitely."

What Manufacturers Should Expect in South America

One of the most interesting committee reports made during the first day sessions was that by Charles W. Beaver, The Yale & Towne Mfg. Co., New York American Association, on Foreign Trade. Mr. Beaver recently spent seven months in South America gathering material for this report and for his company. The journey covered some 15,000 miles, of which 5000 were via railroads to interior South American points.

His report really was an informal talk on a few of the conditions existing and problems solved there. It began with the statement that it was easy for us to think of South America as far away, remote and uncivilized, when in reality that continent is far ahead of us in so far as art and the sciences go. He asserted, however, that it is by no means ahead of us commercially.

Mr. Beaver said that most of the important South American houses carry large lines of goods, one on the west coast, for instance, carrying 2000. This being true, the American manufacturer cannot expect the South American to specialize in any one thing unless he is encouraged to do so. He said the question we ask ourselves often concerns the South American's honesty: Will he pay his bills? Whereas he is just as honest as the average American and usually pays his bills more promptly. The American need not worry on that score.

Long Credits Necessary

The American cannot get his money in 30 days, however. He must give long credits, at least 60 to 90 days. He can charge 6 per cent interest to credit accounts, to which no serious objection is found.

The South American necessarily must invest a large amount of money in his business because so far removed from production points, very often 10 times more than a firm of similar importance in this country. The American dealing with reputable South American houses therefore can rest assured the South American has plenty of money.

Great harm was done in South America, so far as trade relations are concerned, by our mushroom concerns that sprang up during the war, by misrepresentation of goods, their non-delivery, etc. Our southern neighbors told Mr. Beaver this damage cannot be wiped out in 10 years, and that they are demanding sight drafts allowing sufficient time to provide for inspection of American goods bought.

It is the opinion of Mr. Beaver that it is not necessary to have a salesman thoroughly familiar with the line of goods he represents. A courteous, tactful, native-speaking salesman is necessary, however, and one who thinks in the same terms as the South American. The South American market had not been a large one for The Yale & Towne Mfg. Co.'s goods, but it hired a Spaniard, gave him a short intensive training on its line and sent him to South America, where he sold considerably more than the company had in the previous 12 years combined.

Must Follow Instructions

American manufacturers and dealers must follow to a letter instructions given by South Americans as to packing. If instructions are to pack the goods in gold cases, do it, said Mr. Beaver, for the South American will pay all the extra cost. There is always a reason for such instructions. Possibly the South American merchant wants to send the goods up into or over the mountains. He knows the width of mountain passes and trails and knows that if a box is too long it may hit the side of the mountain, throwing the mule and his load into the valley below.

All goods shipped should be amply insured as a special guard against pilfering. Of the goods shipped into Peru annually, 32 per cent are stolen before reaching destination. Two out of a consignment of Ford

cars recently were stolen, and 90 barrels of cement from a consignment. One Peruvian customs official endeavoring to uphold the fair name of his custom house, published in a newspaper that only 20 per cent of the goods passing through his customs house were stolen. Reward for upholding the honor, as might be expected, was a discharge.

Some Minor Important Details

American manufacturers should keep South American customers constantly advised as to goods in process of manufacture and in transit.

Documents should be properly prepared, for if papers are not so prepared, goods are liable to remain in storage at some customs house until the papers are returned to America for correction. In the meantime storage charges accumulate.

Mr. Beaver advises keeping away from the small South American merchant, for if you sell the big fellow and then the small one, the former never again will have dealings with you.

The American manufacturer should never believe he can turn his South American business off and on like water, which he is inclined to do, according to the state of the domestic market. He should allocate his output of goods and stick to it and let the South American know he is doing it.

A two-cent stamp should not be placed on letters demanding a five-cent stamp. And to insure delivery of mail, all letters should be registered. Even the South American merchant himself distrusts his mail service, going to the post office for his mail instead of depending on delivery, which explains why so many merchants there give a post office box number as an address.

Growing Use of Trade Acceptances

In view of the present stringency in the money market, trade acceptances were thoroughly discussed. A call for hands showed that more than a dozen firms represented at the first morning meeting of the National Association use trade acceptances, whereas, the same question put in 1919 brought to light only two hands.

During the discussion the question of just what f.o.b. signified was brought up. It was stated the association had secured legal opinion on the question and that f.o.b. does not mean loaded on cars without signed bill of lading; therefore payment for goods necessarily should not be demanded on rendering a bill of lading.

Default on trade acceptances has not been frequent in the mill supplies and machinery business, but Mr. Fernley, secretary, stated that a certain class of brokers had speculated by means of the trade acceptance, thereby assisting in inflating prices on commodities in other lines and in stocks, and that the situation in this respect alone was serious because of the abuse.

The question was discussed as to what the custom was among the members as to charging interest on past due accounts. One member suggested that the manufacturers of supplies have their uniform discounts, and it would seem not to be a difficult matter in his judgment for the jobbers to have a uniform discount. The question was referred to a committee to report back later in the convention, but the matter, owing to the pressure of other business, was not brought up again.

The general impression was that trade acceptances will be used more and more so long as the present stringent money market conditions continue.

During the discussion the question was asked by President Nicklis how many of those present to the best of their knowledge had larger inventories than they did a year ago, and the yeas outnumbered the noes three to one.

Cost of Doing Business

The cost of doing business was discussed in all three conventions, because each association during the past year has been making an extended study of the question for the purpose of placing the mill supply houses on a more scientific business basis.

The report of Alvin M. Smith, secretary-treasurer of the Southern Association, touched on the subject and showed that the cost since 1913, insofar as the association has been able to determine, has been as follows:

	Per Cent.
1913	14.45
1914	16.83
1915	18.256
1916	14.83
1917	17.30
1918	14.90
1919	15.40

In connection with the association's efforts to determine the cost of doing business, it sent out a questionnaire to the members requesting the average percentage of income tax paid for 1919 as compared with net profits. Thirty-five replies were received, which showed an average of 25.64 per cent.

The National Association prepared for distribution a chart showing the results of its investigations on this subject, which showed an average of cost of something better than 17 per cent last year. This report, however, like that of the Southern Association, is rather incomplete, but it, nevertheless, shows that the association is making progress in the right direction.

Must Pay for Loyalty

"If you want loyalty and enthusiasm, you must pay for it," declared B. Berntsen, H. Channon Co., Chicago, in addressing the members of the National Association. The subject under discussion at this time was Methods of Securing Efficiency and Loyalty in Our Employees. This serious statement regarding a serious subject was followed by remarks by him which caused much amusement among his listeners.

Asserting that get-together affairs, all kinds of clubs, including baseball, bowling, etc., had failed in their purpose in the case of his company, he told of what other concerns are doing or trying to do to make employees contented, loyal and efficient. He told of jazz bands, pianos, phonographs, dentists, free legal advice, bathing pools, dances, bank accounts, training schools, moving pictures, insurance, hospitals and many other things in a manner that convulsed with laughter his listeners. In closing his remarks he returned to the serious and again asserted that "if you want loyalty, you must pay for it."

C. J. Smith, Stambaugh-Thompson Co., Youngstown, Ohio, and J. W. Wright, Colcord-Wright Machinery & Supply Co., St. Louis, speaking on this subject, agreed that stock ownership had worked out favorably, but other methods employed by their respective companies to make employees contented and loyal varied considerably. The talks by these gentlemen demonstrated that no set rules can be laid down for creating loyalty, and that individual managements must work out their own salvations.

Growth of Organizations

Reports made by the different membership committees show a healthy growth of the three organizations at a trying period in our industrial and business life. The National Supply and Machinery Dealers' Association has a membership of 261, as against 220 a year ago, a gain of 41.

I. W. Lemaux, American Supply and Machinery Manufacturers' Association, reported a gain of 41 new members, bringing the total number up to 286. The Southern Association in the 16 months just ended gained 46, making the total membership 156.

A. S. M. E. Receives Praise

The A. S. M. E. was given much praise for its progress in standardization by D. J. Campbell, Dodge Mfg. Co., Mishawaka, Ind., chairman, standardization committee, American Association, who urged even greater co-operation with that society.

SHORT TRADE ITEMS

The American Iron Products Co., Inc., of 107 Liberty Street, New York, has just been appointed the sole United States distributor of John Nicholson & Sons, Ltd., Sheffield, Eng., manufacturers of high-speed tool steel. The company will carry a stock in its Brooklyn warehouse and gradually extend its stocks to New England and central western points. The development of the business will be in charge of Alexander Hart, Jr., formerly the Detroit manager of the Davidson Tool Mfg. Corporation and the Fairley-Davidson Steel Corporation. Mr. Hart assumes his duties on June 1.

Mackintosh, Hemphill & Co., Pittsburgh, builders of engines, rolling mill and steel works equipment of all kinds, have completed a 32-in. universal mill for the Jones & Laughlin Steel Co., to be installed in the Soho works, Pittsburgh, also a 27-in. universal mill with mill tables and other accessories for the Dominion Iron & Steel Co., Hamilton, Ontario, Canada. The company has just about completed a very large contract for Tata Iron and Steel Co., India, consisting of a 40-in. blooming mill complete with shear tables, manipulators and all accessories.

The Compania Siderurgica del Mediterraneo of Sagunto, Spain, through its engineers, Frank C. Roberts & Co., Philadelphia, has placed a contract with the Alliance Machine Co., Alliance, Ohio, for open-hearth charging and crane equipment. It has also placed a contract with the Pennsylvania Engineering Works, New Castle, Pa., for a 600-ton hot metal mixer. This machinery is to be installed at the new iron and steel works now in process of construction by the company at Sagunto.

The naval ordnance plant, located at Miami Chapel Road and the Big Four Railroad, Dayton, Ohio, suspended operations on May 15, and the men employed were given an opportunity of transferring to the Brooklyn Navy Yard. It is understood that all the machinery of the Dayton plant will be transferred to the Brooklyn yard. This plant at the beginning of the war was operated by private interests, but later was sold to the Navy Department.

The Newnam Foundry, a new jobbing foundry for gray iron castings, will start production in July in Kendallville, Ind. Nicholas C. Newnam, the owner, was for many years with Flint & Walling Mfg. Co., Kendallville, Ind.; then with Buffalo-Springfield Roller Co., Springfield, Ohio; then he was secretary of the Butler Co., Butler, Ind., and has an extensive acquaintance among foundrymen.

The Metal Cutting Supplies Co., New Haven, Conn., machine shop supplies, a $100,000 Delaware corporation, has begun business in the Hotel Guarde Building, New Haven. Miss M. A. Gerrity, formerly in the purchasing department, Marlin, Rockwell Co., New Haven, fire arms, and later on the sales force Flint & Chester, New York, is president of the company. Associated with her are Mr. Bliven, general sales manager Century Steel Co., New York, and Mr. Merenus, East River Stores, New York.

The board of directors of the Cincinnati Chamber of Commerce, at a meeting held on May 14, while approving many of the principles set forth in a recommendation for the establishment of a department of public works by the Government, decided to cast a negative vote on the proposition and forwarded the ballot to the Chamber of Commerce of the Unites States at Washington. The board declared that they could not approve of the means for applying these principles as suggested.

The Veithardt Steel & Metal Corporation has been incorporated with offices in the Park Row Building, New York, with F. Veithardt, formerly of the United Steel & Metal Corporation, as president and treasurer, and H. D. Mills, fomerly of Simon & Mills, as secretary. This company is successor to the United Steel & Metal Corporation.

Some 200 manufacturers attended the annual meeting of the Stove Founders' National Defense Association, on May 11, and the National Association of Stove Manufacturers on May 12 and 13, at the Copley Plaza, Boston. Lee W. Van Cleave, St. Louis, president National Association of Stove Manufacturers, presided. The chief topics of discussion were the labor situation, tendencies of the trade, freight classifications, foreign conditions and the opportunity for foreign trade development. R. S. Wood, Troy, N. Y., was in charge of arrangements.

The Lycoming Foundry & Machine Co., Williamsport, Pa., announces the change of its name to Lycoming Motors Corporation. It will continue the manufacturing of automobile motors, with no change in the personnel

The Ruth Coal & Coke Co., Uniontown, Pa., has just announced the sale of 3200 acres of coal land in Marshall County, W. Va., to E. T. Hitchman of Wheeling, W. Va., declining to state the consideration which, however, is reported in the neighborhood of $500,000.

The Akron-Newton Furnace & Machine Co., Youngstown, Ohio, has purchased the plant of the Hall Mfg. Co., Newton Falls, Ohio, and will engage in the manufacture of the Garl automatic signal light, for which machinery will be installed at once. James W. Heller is president; E. D. Reed, vice-president; R. W. McCullum, secretary.

The Hoosier Rolling Mill Co., Terre Haute, Ind., has awarded a contract to N. D. Brill & Son for the erection of the first unit of its proposed new plant, 100 x 600 ft. The project is in charge of the Shrouds-McCormick Co., Tribune Building, Chicago.

The V-B Engineering & Mfg. Co., formerly of Mt. Gilead, Ohio, has moved to 1215 Harrison Avenue, Columbus, Ohio.

A number of industrial companies in the New York district has been seriously affected by material shortage owing to transportation conditions. The Union Drawn Steel Co., 464 Washington Street, New York, has been compelled to curtail operations to a low point, and the company's branch plant at Beaver Falls, Pa., is also practically closed down. F. W. Wurster & Co., 375 Kent Avenue, Brooklyn, manufacturer of axles, etc., is operating at considerably reduced capacity, and the business has been practically halted. The E. W. Bliss Co., Adams and Plymouth Streets, Brooklyn, manufacturer of presses, machinery etc. has been using motor trucks for material supplies from New Jersey and points in Pennsylvania, with limited stocks securable in this way, and at considerable expense.

The Home Electric Appliance Co., Pittsburgh, maker of electrical equipment, has increased its capital from $50,000 to $250,000 and will make some additions to its plant.

L. M. Baker has been appointed exclusive representative in Michigan for the Dittmer Gear & Mfg. Corporation, Lockport, N. Y., which was organized last November. Mr. Baker has resigned as supervisor of sales of the motor equipment division of the Hyatt Roller Bearing Co. His headquarters will be in the Book Building, Detroit.

The Serena Mfg. & Plating Co., McKeesport, Pa., has been incorporated with a capital of $60,000 to manufacture patented metal holding devices.

Six hot mills of the Eastern Rolling Mills Co., Eastern Avenue and Sewer Road, Baltimore, were put into operation May 17. Mayor William F. Broening, of Baltimore, set the mills in operation. The company will put six additional mills into operation later. J. M. Jones, Lexington Building, Baltimore, is president.

Machinery Markets and News of the Works

LULL CONTINUES

Demand for Machine Tools At Low Ebb

Some Manufacturers, However, Do Not See Any Reason for Pessimism

The machine tool markets are quiet, presenting quite a contrast to the conditions which prevailed only a few weeks ago. There is a decided let-up in buying and inquiries also are few. Some of the machine-tool builders, however, see no ground for pessimism. At the spring meeting of the National Machine Tool Builders' Association at Atlantic City last week the feeling was quite general that, if there is to be a business depression, machine tools will not be seriously affected. This feeling is based on the fact that there are well-filled orders books, and that a depression could not last more than a few months. In the opinion of the machine-tool trade, buyers who look for lower prices in the near future will be disappointed, it being pointed out that there will be no likelihood of reductions as long as costs of labor and materials remain at anywhere near their present levels.

Even if there should be no early resumption of buying by manufacturing plants, it is expected that railroads will shortly enter the market for considerable equipment. Their needs are urgent and large. The Norfolk & Western and the Chesapeake & Ohio, which have recently issued good sized lists, may buy as soon as quotations are compiled, while the Pennsylvania, Erie, Delaware, Lackawanna & Western and other roads are known to be figuring on extensive purchases. The St. Louis-San Francisco Railway has bought a number of tools from Cincinnati builders.

To overcome present transportation difficulties, some machine-tool dealers in Cleveland are consolidating shipments from manufacturers in carload lots to that point, from which the tools are re-shipped to various customers. Some machine-tool plants report that they are having less trouble in making shipments than two or three weeks ago.

New York

NEW YORK, May 25.

The situation in regard to inquiries and orders for machine tools is no better and sellers are largely occupied with efforts to solve the future. It is undeniable that the present credit situation, the railroad tie-up and the wave of liquidation among retail stores have created a spirit of uncertainty. However, if the country is to have a business depression, it is regarded as likely that the machine-tool industry will suffer comparatively little, especially if that depression is of short duration. Machine-tool builders have their order books filled well into September or later, and so far there have been no cancellations of importance. As for a reduction in prices, the majority do not look for such a possibility as long as the wages paid to labor remain at the present levels. Moreover, it is believed that the buying of machine tools by the railroads, which must come soon if the roads are to overcome their present shortage of equipment, will offset any marked falling off in business in other quarters.

Aside from some of the large projects, there has been little buying in the past week. The General Electric Co. continues to inquire for tools for its Bridgeport, Conn., plant.

Railroad business has not materialized in volume, but the trade is expecting much in this direction, regardless of what may happen to general business. The Norfolk & Western and the Chesapeake & Ohio lists are active and may be bought soon. In addition, the Erie Railroad, which will enlarge its round house at Susquehanna, Pa., the New York Central, the Delaware, Lackawanna & Western and the Pennsylvania are all expected to buy during the next few months.

There is a continued slackening in sales of cranes and the number of inquiries has decreased considerably. The attitude of many buyers seems to be one of waiting for further developments in the industrial situation before buying. The United Electric Light & Power Co., New York, in the market for a 110-ton and a 75-ton overhead traveling crane has again revised its inquiry. The Federal Shipbuilding Co., Kearny, N. J., has also revised its inquiry for a 5-ton crane. The Draycott Mills, Inc., 60 Federal Street, Boston, Mass., is in the market for a 5-ton, 3-motor overhead traveling crane.

Among recent sales are: The American Metal Co., 61 Broadway, New York, two 10-ton, 26-ft. and 50-ft. overhead traveling cranes from the Morgan Engineering Co.; the Brooklyn Rapid Transit, 85 Clinton Street, Brooklyn, N. Y., a 7½-ton overhead traveling crane from the Erie Steel Construction Co.; H. F. Curtis, 1270 Broadway, New York, a 35-ton locomotive crane from the Ohio Locomotive Crane Co.; Stone & Webster, New York, a 20-ton locomotive crane from the Browning Co. for the Lowell Electric Lighting Corporation, Lowell, Mass., and J. G. White & Co. a second-hand, 25-ton Industrial locomotive crane.

The Biltwell Auto Body Co., 59 Jackson Avenue, Brooklyn, manufacturer of automobile bodies, has had plans prepared for a one-story works, 100 x 100 ft., at Morgan and Lombardi streets, to cost about $35,000.

The Original Tool & Die Works, New York, has been incorporated with a capital stock of $51,000 by J. Kovath and A. Schiff, Crotona Park, to manufacture tools, dies etc.

The Edison Lightbrier Corporation, New York, has been incorporated with a capital of $30,000 by S., W. H. and L. J. Shlesinger, 280 Broadway, New York, to manufacture metal electric and gas fixtures.

The B. & C. Mfg. Co., 294 Church Street, New York, manufacturer of bicycle parts, has completed plans for a new plant to cost about $25,000.

The American Distress Signal Co., New York, has been incorporated with a capital of $200,000 by E. J. Garity, F. T. Hendl and M. Scholder, 16 West 107th Street, to manufacture electrically operated fire and burglar alarm systems.

The Rainier Motor Co., 225 West Fifty-eighth Street, New York, has awarded contract to the Barney Ahlers Construction Co., 110 West Fortieth Street, for a one-story building, 60 x 300 ft., on Bradley Street, near Bayside Avenue, Flushing, L. I., to cost about $30,000.

The Aluminum Co. of America, 120 Broadway, New York, manufacturer of aluminum products, electrical wires, etc., is arranging for an addition to its plant at Massena, New York, to cost about $200,000.

The Self-Winding Clock Co., 161 Grand Avenue, Brooklyn, has awarded a contract to Peter Guthy, 926 Broadway, for additions to its five-story plant and improvements in the building, to cost about $100,000.

The National Galvanizing & Plating Equipment Corporation, 52 Broadway, New York, has filed notice of dissolution.

The Clermont Machine Co., New York, recently incorporated with a capital stock of $30,000 to manufacture machinery and parts, will merge the company known as Fumagalli, Cardone & Surico, 239 Sullivan Street, New York, into its new organization. A. O. Brill and C. Surico head the company. The company absorbed has been engaging in a similar line of work.

The Nichols Copper Co., 25 Broad Street, New York, with plant at Laurel Hill, L. I., has completed plans for a one-story addition, 62 x 196 ft., to cost about $20,000. The J. G.

White Engineering Corporation, 43 Exchange Place, is in charge.

The Lord Construction Co., 105 West Fortieth Street, New York, has compiled a list of machinery and tools for its new shipyard at North Bergen and Guttenburg, N. J., to be operated in the name of the Lord Dry Dock Co. The equipment will include heavy duty lathes, punches, shears, radial drills, milling machines, boring and drilling machines, grinders, punches, etc. Most of the equipment will be for electric drive.

The Waterblade Washer Co., New York, has been incorporated with a capital stock of $50,000 by L. M. and H. W. Higly, and C. H. Fowler, 126 Liberty Street, to manufacture mechanical washers, nozzles, etc.

The Variety Tool & Metal Stamping Co., New York, headed by H. Weinberg, 916 East 169th Street, recently incorporated to manufacture tools and other metal specialties, has filed notice of dissolution of a former company of this name.

The Simmons Economy Tool Corporation, 981 Broadway, Albany, N. Y., has arranged for the immediate erection of a new plant on Broadway, to cost about $75,000, and to be equipped as a machine shop and for general tool manufacture. The company was recently incorporated with a nominal capital stock of $23,000. Charles A. Simmons is president. Others interested are C. A. Simmons and F. J. Corrigan.

The United States Expansion Bolt Co., 25 Elm Street, New York, has leased property at 139-41 Franklin Street, for use in connection with its local works.

The Pendall Boiler Co., Schenectady, N. Y., has been incorporated with a capital of $100,000 by O. Pendall, M. Everetts and F. Weinberg, to manufacture boilers and kindred products.

The Babcock-Ausina Corporation, New York, has been incorporated, with a capital stock of $25,000, by E. C. Kerr, E. A. Ausina, Jr., and R. P. Babcock, 29 West Thirty-eighth Street, to manufacture machinery and parts.

The Charles Fischer Spring Co., 473 Kent Avenue, Brooklyn, manufacturer of springs and kindred steel products, has awarded a contract to the Gretsch Engineering Co., 103 Park Avenue, New York, for a four-story, steel and concrete plant at Kent Avenue and North First Street, to cost about $200,000.

The Senter Robbins Metals Co., 217 Broadway, New York, has increased its capital stock from $10,000 to $150,000.

The Excelsior Phonograph Corporation, New York, has been incorporated with a capital stock of $300,000 by T. and R. Tigani, and J. Schlosser, 537 Linton Avenue, to manufacture talking machines and parts.

The Horace Keane Aeroplanes, Inc., New York, has been incorporated, with a capital stock of $125,000, by S. H. Mapes, W. M. Sage and Horace Keane, 280 Madison Avenue, to manufacture airplanes and parts.

The Ryan Garage Co., 358 East Fifth-seventh Street, New York, has leased a two-story and basement building, 60 x 100 ft., at Lexington Avenue and 119th Street, for a service and repair works. Improvements will be made to accommodate the business.

The General Motors Acceptance Corporation, Broadway and Fifty-seventh Street, New York, a subsidiary of the General Motors Corporation, has increased its capital stock from $2,000,000 to $4,000,000.

The Carnay Body Co., Long Island City, N. Y., has acquired about 7500 sq. ft. on Pearson Street, near Jackson Avenue as a site for a two-story plant for the manufacture of motor truck bodies. John A. Carnay heads the company.

James W. Kent, 39 Gold Street, Brooklyn, has filed plans for the erection of a one-story machine shop, 47 x 100 ft., on Plymouth Street, near Bridge Street, to cost about $15,000.

The Janusch Mfg. Co., 496 East 134th Street, manufacturer of brass, bronze and iron specialties, has had plans prepared for extensions and improvements in its plant to cost about $8,000.

The Astoria Light, Heat & Power Co., 130 East Fifteenth Street, New York, will erect a two-story boiler plant on Winthrop Avenue, near Van Alst Avenue, 50 x 85 ft., to cost about $55,000.

Stephen Ransom, 401 West Street, New York, operating a ship and general marine works, boiler plant, etc., has filed plans for two one-story shops on Hamilton Avenue, near Third Avenue, Brooklyn, 160 x 200 ft. and 55 x 70 ft., to cost about $250,000, including equipment.

The Vulcan Rail & Construction Co., 35 Meserole Street, Brooklyn, manufacturer of architectural iron specialties, has increased its capital stock from $100,000 to $250,000.

The Vulcanite Roofing Co., Tivoli Street, Albany, N. Y., is having plans prepared for an addition to cost about $20,000.

P. F. & W. A. Kane, Inc., New York, has been incorporated with a capital stock of $250,000 by L. T. Albert, H. S. Cook and C. J. Briody, 530 West Forty-sixth Street, to manufacture farm implements, etc.

The State Industrial Commission, Trenton, N. J., has taken bids for a one-story mechanical shop, 42 x 110 ft., at the State Industrial School, Bordentown, to cost about $25,000.

Considerable equipment will be required for the proposed new glass manufacturing plant to be erected by the Cumberland Glass Co., Bridgeton, N. J., on Laurel Street, to cost close to $1,000,000. The company is demolishing a number of buildings now on the site and will inaugurate construction at an early date. It is associated with the Illinois Glass Co., Alton, Ill.

The Modern Loom Works, 152 Market Street, Paterson, N. J., has been incorporated, with a capital of $500,000, by Peter G. and Jean Gielen and Joseph H. Miller, to manufacture looms and general textile machinery.

The Ordnance Department has had plans prepared for extensions in the power plant at the Picatinny Arsenal, Dover, N. J. The commanding officer at the arsenal is in charge. Title has been taken to about 250 acres in Raritan Township, heretofore held by Lewis Nixon, for use in connection with the Camp Raritan Arsenal, near Metuchen, N. J., for a consideration of about $46,526.

Landers, Frary & Clark, New Britain, Conn., manufacturers of cutlery, hardware, etc., have acquired the plant of the Capitol Glass Works, Vineland, N. J., as a branch works. The factory will be used for the manufacture of bathroom fixtures, vacuum bottles and other specialties.

The R. E. Oliver Co., Hoboken, N. J., has been incorporated, with a capital stock of $50,000, by Reginald Oliver, Lyndhurst, N. J., and J. W. P. Moordant, Corona, N. Y., to manufacture automobile equipment, parts, etc.

The Everlasting Valve Co., 49 Fisk Street, Jersey City, N. J., manufacturer of valves, etc., has filed plans for a two-story brick addition, to cost about $13,300.

The Anvil Cutlery Corporation, 3526 Hudson County Boulevard, Jersey City, has been incorporated, with a capital stock of $250,000, by Julius Hof, Charles H. Bick and F. M. Umlauft, to manufacture cutlery, knives, etc.

The Passaic Metalware Co., Brook Avenue, Passaic, N. J., manufacturer of metal signs, novelties, etc., has increased its capital stock from $500,000 to $1,100,000.

The Board of Education, Newark, N. J., will receive bids until 8 p. m., June 8, for equipment for the Seymour Vocational School, to be located on Sussex Avenue, near First Street.

The General Lead Batteries Co., 4 Lister Avenue, Newark, N. J., manufacturer of electric batteries, has awarded a contract to Warren Moore & Co., Thirteenth and Market streets, Philadelphia, for a two-story addition, 60 x 100 ft., to cost about $150,000.

The Champion Products Mfg. Co., Newark, has been incorporated, with a capital stock of $124,000, by H. V. Jacobson, S. C. Deixel and F. S. Jones, to manufacture shock absorbers and other automobile equipment.

The Dengler, Liddy, Burd Electrical Co., 207 Broad Street, Elizabeth, N. J., has been incorporated with a capital stock of $100,000 by Edward J. Dengler, Thomas A. Liddy and Frank R. Burd, to manufacture electrical specialties.

The Passaic Bobbin Co., 477 Marshall Street, Paterson, N. J., has been incorporated, with a capital stock of $50,000, by Richard Jacobs and Paul Loshin, to manufacture bobbins and textile machinery, etc.

The Worthington Pump & Machinery Corporation, 115 Broadway, New York, announces that in addition to the well-known lines of hydraulic machinery which it has manufactured since 1840, it has completed preparations to furnish improved water-power machinery of all capacities for low, medium and high head service, including oil pressure system, water wheel governors and other auxiliaries.

Catalogs Wanted

Henry Luaire, 18, Rue du Grand Gonnet, Saint-Etienne (Loire), France, general secretary of an association of metal working manufacturers, desires catalogs and price lists from American manufacturers covering the following kinds of machinery in the matter of the modernization now under consideration of machine tool equipment: Rolling mills for roughing out round, flat and hexagonal merchant iron of from 10 to 35 mm., planing machines, punching machines, drop-hammers, stamping and punching machines, cold forging machines, tap and screw making machines, etc.

New England

BOSTON, May 24.

A merger of manufacturing interests devoted to the production of agricultural machinery and tools has been perfected under the name of Bateman & Companies, Inc., which includes the Richardson Mfg. Co., Worcester, Mass.; Cutaway Harrow Co., Higganum, Conn.; Duane H. Nash, Inc., Millington, Conn.; Belcher & Taylor Agricultural Tool Co., Chicopee, Mass.; Bateman-Wilkinson Co., Toronto, Ont.; McWhorter Mfg. Co., Riberton, N. J., and Bateman Mfg. Co., Grenloch, N. J. The new company is capitalized at $4,000,000, under Massachusetts laws. F. H. Bateman of the Bateman Mfg. Co., will be president of the new organization; Philip N. Curtis, Worcester, vice-president, and F. H. Hillman, Springfield, treasurer. Headquarters will be established in New York.

The Fairmount Foundry & Engineering Works, Second Avenue, Woonsocket, R. I., has filed plans for a new machine shop. It will also build an addition to its foundry, 40 x 45 ft.

The New Haven Sherardizing Co., New Haven, Conn., has increased its capital stock from $50,000 to $100,000.

The Atlas Electric Co., 101 Washington Street, Providence, R. I., has been organized to manufacture electrical specialties. Sylvester F. Argent, 192 Cedar Street, heads the company.

The Hart & Hegeman Co., Hartford, Conn., manufacturer of electric switches, etc., has had plans prepared for a three-story and basement addition of brick and reinforced concrete.

The Brown-Collins Gas Engine Co., Hartford, Conn., has filed notice of dissolution.

The Packard Motor Car Co., Broadway and Sixty-first Street, New York, has completed plans for a new service building on Elmwood Avenue, Providence, R. I., to cost about $100,000.

The Selected Electric Appliance Co., 251 Weybosset Street, Providence, R. I., has increased its capital stock from $60,000 to $125,000.

The New England Tire & Rubber Co., Holyoke, Mass., recently organized to manufacture automobile tires and other rubber products, has acquired property at Willimansett for its proposed plant. C. H. Huntley and F. H. Callahan, both of Springfield, and George P. O'Connell, Holyoke, head the company.

The Brewster-Morton Co., West Conwell, Conn., has been incorporated in Delaware with capital stock of $300,000 by John H. Brewster, West Conwell; Robert K. Morton, Holyoke, and Frank L. Arnold, Orange, N. J., to manufacture carbon and steel alloy products.

The Fafnir Bearing Co., New Britain, Conn., manufacturer of ball bearings, has increased its capital stock from $1,000,000 to $2,000,000.

The Brightwood Brass & Bronze Foundry, Birnie Avenue, Springfield, Mass., has taken bids for a one-story foundry addition, 55 x 65 ft., to cost about $25,000.

The Liberty Ordnance Co., Bridgeport, Conn., has filed notice of change of name to the Morris Metal Products Corporation. The company will specialize in the manufacture of iron and other castings.

The Horton Mfg. Co., Bristol, Conn., manufacturer of steel fishing rods, etc., has increased its capital by an amount of $350,000.

The Mount Carmel Brass Foundry Works, Inc., Hamden, Conn., has changed its name to the Mount Carmel Mfg. Co.

The Walker-Stewart Foundry Corporation, Meriden, Conn., has been incorporated with a capital stock of $50,000 by V. E. Walker, Windsor; Amos Doolittle and J. J. Roach, Meriden, to manufacture iron and steel castings, etc.

The New England Sheradizing Co., Hartford, Conn., has filed notice of dissolution.

The Narragansett Milling Co., Valley Street, East Providence, R. I., has filed plans for a new forge shop, 35 x 40 ft.

The Port Chester Pneumatic Tool Co., Inc., Greenwich, capitalized for $200,000, has taken a Connecticut charter. T. S. Thompson, Daniel Thompson and Harry Thompson, all of East Port Chester, Conn., are interested in the company.

The George H. Adams Co., Hill, N. H., latch needles, has acquired the mechanical equipment and the plant formerly occupied by the American Voting Machine Co., Waltham, Mass., for $31,000. In connection with its regular production it will develop a stamped and punched metals products department. The Hill plant will be operated as heretofore, but the executive and sales offices will be moved to Waltham.

A Massachusetts charter has been granted the Hudson Broach Co., Hudson; ores, metals, forgings, machine tools, boring machines, milling machines and lathes, of which Ralph R. Lapointe, 29 Tower Street, Hudson, is president, and Fred B. Dawes, 11 Pleasant Street, Hudson, is treasurer. These men and Frank F. Cutting and Philip J. Aronson, Boston, and Harry S. Wilson, Swampscott, Mass., constitute the board of directors. The company is capitalized for $50,000, consisting of 300 shares of common stock, par $100 and 200 shares of preferred, par $100, all unissued.

The Frank O. Wells Co., Inc., Greenfield, has taken a Massachusetts charter to manufacture machinery, machine tools and parts, supplies and accessories and to conduct a foundry and machine shop. Of the company's 2500 shares of preferred stock, par $100, 1000 are issued against property and machinery. Of the 10,000 shares of common stock, no par value, 3000 shares are issued against patent rights, 2096 against services and four shares against cash. The property, which is equipped, has an area of 41,344 sq. ft. Frank O. Wells, Greenfield, is president and vice-president, and J. Tennyson Seller, Greenfield, is treasurer. They and David Miller, Greenfield, Walter H. McCarthy, West Springfield, and J. Howard Jones, Springfield, constitute the board of directors. Mr. Wells formerly was president of the Greenfield Tap & Die Corporation, Greenfield.

The Bay State Welding Co., Boston, has been incorporated under Massachusetts laws to take over the going co-partnership of Frederick H. Baldwin, Gregory D. G. Baldwin and Ralph A. Gooch, 56 Long Wharf, Boston. The new company is capitalized for $10,000, consisting of 100 shares, par $100, of which 60 are issued.

The Goyer Co., Hartford, Conn., textile knitting needles, has plans under way to triple its output. A. E. Greene is president and treasurer, and E. P. Hayes, vice-president.

The Maxim Corporation, Derby, Conn., plant, together with four lots of late type machine tools and machinery and mechanical equipment, will be sold at public auction, May 26.

Plans are being drawn for a municipal two-story and basement machine shop, 50 x 125 ft., for the city of Hartford, Conn. It will cost between $70,000 and $75,000.

A Massachusetts charter has been granted the Trotman Machine Wire Co., Inc., Holyoke, Mass., capitalized for $60,000. Walter K. Trotman is president and treasurer.

Philadelphia

PHILADELPHIA, May 24.

The Fox Motor Co., 2545 North Broad Street, Philadelphia, is arranging for a three-story brick and concrete plant on property fronting the Philadelphia & Reading Railroad, vicinity of Tabor Street. Ansley H. Fox is president.

The Montgomery Iron & Steel Co., 1832 North Ninth Street, Philadelphia, has acquired property at the corner of Ninth Street and Montgomery Avenue, comprising about 37,500 ft., formerly used by the Steward & Stevens iron foundry. It has also secured title to all land between Montgomery Avenue, Berks and Ninth streets and the Philadelphia & Reading Railroad, to be used in connection with its works.

The Hurley Motor Co., Broad and Race streets, Philadelphia, has filed plans for a fifteen-story brick and concrete building, 58 x 130 ft., in the vicinity of its present location, to cost about $750,000.

Blair, Campbell & McLean, Inc., Colonial Trust Building, Philadelphia, manufacturer of special machinery, has changed its name to the American Chemical & Sugar Machinery Co.

Fire, May 17, destroyed a portion of the machine shop and mechanical works of the Atlantic Refining Co., Point Breeze section, Philadelphia, with loss estimated at $10,000. Headquarters of the company are at 3144 Passyunk Avenue.

The Schuylkill Forge Co., Third and Luzerne streets, Philadelphia, has filed plans for a one-story forge shop addition to cost about $15,000.

The Lindley Auto Repair Co., 500 West Lindley Avenue, Philadelphia, has filed plans for a one-story machine and repair works.

The Philadelphia Insulated Wire Co., Philadelphia, recently incorporated with a capital stock of $2,500,000 to manufacture insulated wire and similar products, has taken title to a five-story building at Third and Race streets for a consideration of $157,500.

The Esterbrook Steel Pen Co., Camden, N. J., is taking bids for an addition to its plant.

The William R. Thropp & Sons Co., East State Street, Trenton, N. J., manufacturer of rubber mill machinery, etc., has filed plans for the erection of an addition.

The Thermoid Rubber Co., Whitehead Road, Trenton, N. J., manufacturer of brake linings, mechanical rubber goods, etc., will build additions to cost about $500,000, including equipment. Foundation work has been started, and

it is proposed to have the extensions ready for occupancy within a few months. The company has recently increased its capital stock from $1,650,000 to $5,000,000. J. Oliver Stokes is president and W. J. B. Stokes, treasurer.

The Camden Shipbuilding Co., Camden, N. J., has increased its capital stock from $200,000 to $600,000.

The General Electric Co., Edison Lamp Works Division, Harrison, N. J., is considering plans for new works at Wyoming Avenue and Walnut Street, Scranton, Pa., to cost in excess of $500,000.

Fire, May 17, destroyed a portion of the plant of the Franklin Steel Works, Franklin, Pa., with loss estimated at $75,000. It is a subsidiary of the Chicago Railway Equipment Co.

The West Point Foundry Co., West Point, Pa., is being organized by M. James, Catasaqua, Pa., and Samuel Strauss, Norristown, to manufacture iron and steel castings. It has acquired a building at West Point, formerly used by the local traction company, which will be equipped at once.

The Wayne Avenue Garage & Motors Co., Philadelphia, has been incorporated with a capital stock of $50,000, to operate a repair works, manufacture automobile parts, etc. Arthur E. Shaw, 5214 Wayne Avenue, is treasurer.

The International Motor Co., Ninth Street, Allentown, Pa., has had plans prepared for an addition 300 x 500 ft., serving as an extension to a building 300 x 600 ft., now nearing completion. The company is negotiating with the city for the closing of streets to allow for the erection. L. J. Holmes is manager.

S. M. Byers, 120 South Main Street, Washington, Pa., will build a three-story automobile service and repair works, 100 x 120 ft., on East Main Street, to cost about $100,000.

The Philbrin Corporation, Merion, Pa., has been incorporated in Delaware with a capital stock of $1,500,000 by H. Boardman Hopper, Merion; Rowland S. Phillips, Kennett Square, Pa., and Firman S. Houson, Wayne, Pa., to manufacture electric starting systems.

The Penn Washer Co., Hatfield, Pa., is taking bids for a one-story addition, 25 x 36 ft., to be equipped as a machine shop. O. J. Moyer is head of the company.

The Lehigh Valley Transit Co., Allentown, Pa., has arranged for the establishment of a new foundry for the production of carwheels and other railroad specialties. Its building on Madison Street, near Chew Street, will be utilized for the works, and an electric furnace will form part of the equipment. It is planned to begin operations at the earliest possible date.

The Oaks Engineering & Machine Co., Oaks, Pa., has been incorporated with a capital stock of $60,000 to manufacture machinery and parts. James K. Roland, West Reading, is treasurer.

The Windsor Motor Co., 20 North Fourth Street, Reading, Pa., has taken bids for a two-story service and repair building at 44 North Fourth Street, 60 x 230 ft., estimated to cost about $50,000.

The Sharples Specialty Co., West Chester, Pa., manufacturer of centrifugal machinery, has awarded contract to Barclay White & Co., 1713 Sansom Street, Philadelphia, for a one-story plant at Twenty-third and Westmoreland streets, to cost about $75,000.

Catalogs Wanted

The Niles-Bement-Pond Co., Mifflin and Meadow streets, Philadelphia, desires catalogs for its crane department on electrical supplies, shop equipment, etc.

Baltimore

BALTIMORE, May 24.

The Hagerstown Foundry Co., North Jonathan Street, Hagerstown, Md., is taking bids for a two-story machine shop, 60 x 80 ft., to cost $70,000, including equipment.

The Chesapeake Shipbuilding Co., Baltimore, has filed notice of dissolution.

The Kennedy Corporation, Charles and Wells streets, Baltimore, recently organized with a capital stock of $2,000,000, is having plans prepared for a one-story foundry at Curtis Bay, to cost about $100,000. It will form a unit of the company's new plant in this district, to be used for the manufacture of gear cases, cylinders, automobile parts, etc. Joseph P. Kennedy is president.

A. P. Vane, of Vane Brothers, Baltimore, operating a ship chandlery works at 602 East Pratt Street, has acquired the plant of the Delaware Shipbuilding Co., Seaford, Del., which has been idle for more than a year. It is planned to inaugurate operations at once in new construction and repair work.

The Allright Mfg. Co., Greensboro, N. C., manufacturer of metal plumbing specialties, is planning for the construction of a three-story factory, 60 x 200 ft., to cost about $100,000 including machinery.

The Patapsco Iron Works, Inc., Ostend and Wicomico streets, Baltimore, has increased its capital stock from $25,000 to $100,000.

The Keystone Radiator Works, Inc., 1941 Frederick Avenue, Baltimore, has been incorporated with $100,000 capital stock to manufacture seamless tube, honeycomb radiator cores for automobiles, etc. The incorporators are George F. Switzer, John M. and Gus C. Ott.

The Universal Roller Bearing Corporation, National Bank of Commerce Building, Norfolk, Va., has been organized. A. M. Ruckeyser is interested.

With $25,000 capital stock, the Rado-Valve Corporation, Richmond, Va., has been chartered. G. B. Hutchings is president and A. M. Gover secretary.

Plans are being made by J. G. Arnold, Greer, S. C., to establish an automobile repair shop, 60 x 93 ft.

The Southern States Phonograph Co., Atlanta, Ga., has been organized to manufacture talking machines, parts, etc., by A. H. Carlyle, president Talking Book Corporation, 358 Fifth Avenue, New York; John H. Emerson, president Emerson Phonograph Co., 3 West Thirty-fifth Street, New York, and associates. The company has acquired a local building with adjoining property, 300 x 310 ft., for a consideration of about $140,000, and will use the land for the erection of an addition. The existing building will be remodeled to accommodate the new business. The complete plant is estimated to cost close to $1,000,000, including machinery. It is planned to rush construction and have a portion of the works ready for service during the summer. A. H. Carlyle will be president of the new company.

The C. A. Trussell Motor Co., Athens, Ga., is planning for the erection of a new three-story works, 40 x 106 ft., to cost about $35,000.

The Harloe Tire Co., Winchester, Va., has been incorporated with a capital stock of $500,000 by Morton Harloe, Winchester, and Newton King, Clifton Station, Va., to manufacture automobile tires.

The American Locomotive Co., Richmond, Va., is planning for extensions and improvements in its local plant to cost about $10,000.

The C. H. Turner Foundry Co., Statesville, S. C., will install equipment costing about $5,000 in its new foundry, which will have a daily capacity of about 4 tons of castings.

Buffalo

BUFFALO, May 24.

The Niagara Radiator & Boiler Co., Oliver Street, North Tonawanda, N. Y., manufacturer of radiators and boilers, has awarded contract to the Lackawanna Bridge Co., Bell and Abby streets, Buffalo, for a one-story addition, 70 x 190 ft., to cost about $150,000, including equipment.

The Iroquois Tool & Stamping Co., Buffalo, has increased its capital stock from $10,000 to $100,000.

The Tonawanda Power Co., Sweeney Building, North Tonawanda, N. Y., has broken ground for a one-story machine shop at 447 Robinson Street, to cost about $15,000.

The Thomas Coupling Corporation, Erie, Pa., has been incorporated in Delaware with capital stock of $1,000,000 by B. E. and M. T. Thomas, Erie, and Walter Bould, Titusville, Pa., to manufacture couplings for automobiles and kindred specialties.

The Smart Turner Machine Co., Barton Street, East Hamilton, Ont., has commenced the erection of a new plant, 61 x 200 ft., at Nineteenth and Raspberry streets, Erie.

The Hays Mfg. Co., Twelfth and Liberty streets, Erie, manufacturer of saw bands, etc., is taking bids on revised plans for a two-story plant at Twelfth and Peach streets, 55 x 115 ft., to cost about $75,000, including equipment.

The Hollands Mfg. Co., 350 East Eighteenth Street, Erie, manufacturer of machine tools, will build a one-story addition, 20 x 60 ft.

The Batavia Clamp Co., Center Street, Batavia, N. Y., has awarded a contract to J. Lennon & Sons, Buffalo, for a concrete and steel addition to cost about $75,000.

The C. F. Davy Automatic Fire Escape Corporation, Fabius, N. Y., has been incorporated with a capital stock of $750,000 by C. H. Howe, W. R. White and C. F. Davy, 117 Taylor Street, Syracuse, N. Y., to manufacture special iron products.

The United States Light & Heat Corporation, Highland Avenue, Niagara Falls, N. Y., manufacturer of train-lighting equipment, batteries, etc., has awarded contract to the

J. W. Cowper Co., Fidelity Building, Buffalo, for a two-story addition, 80 x 100 ft.

The National Carbon Co., College Avenue, Niagara Falls, N. Y., has awarded contract to the J. W. Cowper Co., Fidelity Building, Buffalo, for a one-story, brick and steel addition, 25 x 300 ft., to cost about $100,000.

The Geneva Automobile Co., 145 Castle Street, Geneva, N. Y., is planning for a two-story machine shop addition, to cost about $25,000.

The John M. Forster Co., 110 Mill Street, Rochester, N. Y., mill supplies, has increased its capital stock to $50,000.

The Smith Wheel Co., North Geddes Street, Syracuse, N. Y., manufacturer of automobile wheels, has had plans prepared for an addition to cost about $25,000.

The Sauzedde Mfg. Corporation, Binghamton, N. Y., has been incorporated with a capital stock of $500,000 by C. Sauzedde, J. A. Curts and E. J. Sweeney, to manufacture automobile wheels.

The M. L. Oberdorfer Brass Co., 804 East Water Street, Syracuse, has awarded contract to the A. & T. Engineering Corporation, 115 South Salina Street, for a foundry addition.

The Eastman Kodak Co., Kodak Park, Rochester, N. Y., is planning for the erection of a new machine shop, 150 x 360 ft., to cost about $275,000. A new power plant will also be constructed, 98 x 145 ft., to cost $200,000, with equipment.

In our issure of May 6 it was stated that the Bering Steel Foundry Co., Morris Street, Buffalo, was planning for the erection of two additions. This was an error and refers to the Strong Steel Foundry Co., Morris Street, which has built one addition and expects to erect another in the near future. The Bering company is not located on Morris Street.

Cleveland

CLEVELAND, May 24.

The machine tool market in this district is even more quiet than a week ago, with probably less activity than at any time since the pre-war period. No new lists have come out and action on lists issued is held up pending an improvement in the transportation situation. Sales of single tools are not plentiful.

Shipments of machinery from manufacturers' plants are made with great difficulty and needed tools are long delayed in transit. Some machinery houses are consolidating shipments from manufacturers in car lots consigned to Cleveland and these are being reshipped from here to various buyers in this section. Some points, however, cannot be reached in this way.

The Browning-Sommer-Adams Co., Cleveland, which recently took over the Victor R. Browning Co., has completed its new organization. C. B. Ellingwood, president Forest City Steel & Iron Co., is president; L. E. Sommer, vice-president and general manager, and Frank H. Adams, secretary and treasurer. Victor R. Browning is chief engineer and sales manager.

The American Can Co., 1677 East Fortieth Street, Cleveland, is having plans prepared for a three-story addition.

The Equipment Mfg. Co., Conneaut, Ohio, is adding a foundry to its plant and in addition to its present line of trucks will engage in the manufacture of gas power factory tractors.

The Akron Spark Plug Co., Hippodrome Building, Cleveland, has placed contract for a one-story factory, 60 x 125 ft.

The Osgood Co., Marion, Ohio, is enlarging its plant by the erection of a 200-ft. extension to its machine shop and erecting room. The company has just completed a building, 80 x 140 ft., to be used as a foundry and engine room.

The Commercial Steel Castings Co., Marion, Ohio, is enlarging its foundry by a 120-ft. extension which will increase its capacity about one-third.

The Hykon Mfg. Co., Alliance, Ohio, has been incorporated with a capital stock of $100,000. It has been operating a plant for some time and manufactures automobile castings and machine tools.

The Mount Vernon Bridge Co., Mount Vernon, Ohio, has increased its capital stock from $300,000 to $1,000,000.

The Warren Iron & Steel Co., Warren, Ohio, has commenced the erection of an addition and has made application for an increase in its capital stock from $200,000 to $2,250,000.

The Dresser Car Door Seal Co., Toledo, Ohio, incorporated with a capital stock of $1,000,000, will build a plant for the manufacture of box car seals. C. J. Dresser and F. M. Dresser are interested.

Milwaukee

MILWAUKEE, May 24.

An encouraging development in the local machine tool market is the improvement in traffic conditions. Tool builders have been able to make shipments to the East in considerably larger volume than for three months, carlot deliveries having been especially facilitated. However, the unfavorable labor, material and traffic conditions in recent months appear to be giving a feeling of hesitancy to buyers, judging from the lull in inquiries in the last two weeks. Purchases are being made in fair volume, however, and milling machine makers are pressed to capacity. The electrical equipment and gas engine industries are the most active buyers. No price advances have been made since April 15 and it is believed that the peak has been reached.

The S. Heller Elevator Co., Milwaukee, has been incorporated with an authorized capital stock of $100,000 to succeed to the partnership business conducted under similar style as manufacturers of electric, hydraulic and hand-power freight and passenger elevators and hoists. The business was established in 1900 by Siegfried Heller, who becomes president and treasurer of the new corporation. Leo Glueckstein is vice-president, and Jacob Freede, secretary. The capacity of the plant at 250-256 Milwaukee Street has been increased 100 per cent during the winter and spring and business booked is sufficient to keep the plant busy for six to eight months.

The Beloit Iron Works, Beloit, Wis., manufacturer of wood-working and paper mill equipment, has awarded contract to the Austin Co., 208 South LaSalle Street, Chicago, for a brick and steel gray iron foundry addition, 117 x 160 ft., costing about $100,000 complete. One 10-ton and one 15-ton crane will be installed.

The Kohler Co., Kohler, Wis., will build a brick and steel addition, 105 x 300 ft., to its gray iron shop to provide additional capacity required by its new department manufacturing motor-generator units for farm lighting and power purposes. The architects are Brust & Philipp, 506 Free Press Building, Milwaukee. Walter J. Kohler is president and general manager.

The Winther Motor Truck Co., Kenosha, Wis., has broken ground for a one-story brick and steel machine shop addition, 51 x 389 ft., which will be equipped for the production of a new six-cylinder passenger car now being built in limited quantities in the present motor truck shops. The building will cost $42,000 and the machine tool and other equipment about $60,000. The equipment is now being placed. Martin P. Winther is president and general manager.

The Stinson Tractor Co., Minneapolis, Minn., which contemplated the erection of a new works at Eau Claire, Wis., for the concentration of production, has decided to hold the project in abeyance pending improvement in the labor, building material and general conditions. The Eau Claire plant is laid out for a daily production of 25 tractors. For the present the factories at Minneapolis and Superior, Wis., will be continued in operation.

The Fulton Co., Milwaukee, manufacturer of automotive accessories and parts, has increased its authorized capital stock from $75,000 to $150,000. It recently completed and placed in operation the first two units of a new machine shop and factory at 742-752 Seventy-fifth Avenue, West Allis.

The Specialty Brass Co., Kenosha, Wis., has concluded arrangements for a branch plant at Albany, N. Y., to handle its growing Eastern trade. Existing buildings are being remodeled and equipped for brass casting and machine shop purposes under the direction of C. William Anderson of Kenosha. It will have a capacity equal to the main works at Somers, Kenosha County, and be ready to begin production about July 15.

The Wentink Mfg. Co., Menasha, Wis., manufacturer of paper and pulp mill machinery, manual car moving devices and other mechanical specialties, has awarded contract to O'Keefe & Orbison, consulting engineers, Appleton, Wis., to design and erect a new machine shop, 60 x 250 ft., part two stories. It will be of brick and steel, with steel sash, and cost approximately $100,000, including additional equipment now being purchased.

The American Axle Co., Chicago, which has started work on a new machine shop at Barton, Wis., in association with Milwaukee and local capital, has organized under the name of Barton Axle Co., with a capital stock of $150,000. The officers are: President, E. W. MacAvoy, Chicago; vice-president and treasurer, Peter C. Wolf, Barton; secretary, George H. Gabel, Milwaukee; directors, W. C. Dayton, Chicago; M. H. Grossman, Milwaukee; Andrew Hauser, Neenah, Wis.; H. W. Suckow and Dr. S. J. Driessel, Barton. The Austin Co., Cleveland, has the general contract for the erection of the shop, which is to be ready for machinery June 21. Power will be purchased from the local utility. Contracts have been placed for machine tools valued at $60,000 and raw materials

costing $50,000. Production will begin July 1. W. C. Dayton is chief engineer.

The Bernert Mfg. Co., 489 Twelfth Street, Milwaukee, has started excavation work for its new plant on Atkinson Avenue, to consist of a foundry and machine shop, 130 x 260 ft., of brick and steel, one story. It will cost about $115,000. The company manufactures pneumatic grain conveying systems and other mill and elevator equipment. George F. Bernert is vice-president and chief engineer.

The Hamilton-Beach Mfg. Co., Racine, Wis., maker of fractional horsepower motors and domestic and industrial labor-saving devices, is preparing to increase the capacity of its main works at Racine about 50 per cent. An Eastern branch plant has recently been established at Waterbury, Conn., which will make the regular line but specialize in the production of an electric carpet washing machine. Fred J. Osius is president and general manager.

Michel & Price, Chippewa Falls, Wis., are establishing a new jobbing machine and repair works on East Columbia Street by converting an existing building, 45 x 75 ft., and erecting an addition.

The Bull Dog Tractor Co., Fond du Lac, Wis., is laying foundations for the first unit of a new machine shop and assembling floor, 100 x 150 ft. The Immel Construction Co., local, is general contractor. Arthur Gruenwald is president and general manager.

The Jersild Fire Escape Co., Waupaca, Wis., which recently made a voluntary assignment to Christian J. Miller, will be sold at public auction June 12 at the offices of Browne, Browne & Smith, attorneys, Waupaca. The property consists of equipment and rights and title to patents.

The Montana Tractor Co., Tinley Park, Ill., is awarding contracts for the erection of its new machine shop and assembling plant, 150 x 200 ft., at Oconto, Wis., which will cost about $150,000 and require a considerable list of miscellaneous equipment. C. H. Haight, vice-president, is in charge of the Oconto operation.

Pittsburgh

PITTSBURGH, May 24.

The Autocar Sales & Service Co., Pittsburgh, will take bids until June 9 for a one-story service and repair building, 225 x 230 ft., at Liberty Avenue and Baum Boulevard, to cost about $120,000, including equipment. H. W. Castor, Girard Building, Philadelphia, is architect.

The Acme Die & Stamping Co., Charters Avenue, McKees Rocks, Pa., has completed plans for a two-story and basement plant on Corliss Street, Sheridan, Pa., 40 x 96 ft.

The Union Engine & Mfg. Co., Butler, Pa., has changed its name to the Union Compressor Co.

The Liberty Tunnel Motor Co., Pittsburgh, has acquired 63 x 183 ft. on West Liberty Avenue, near the southern terminus of the proposed Liberty Tunnel, as a site for a service and repair building.

The Columbiana Foundry Co., 615 House Building, Pittsburgh, has completed plans for a one-story foundry at McKeesport, to cost about $200,000, including equipment. J. C Sullivan is president.

John Gobson, Jr., Pittsburgh, has acquired property at Penn and Richland avenues, 150 x 305 ft., as a site for a plant for the manufacture of automobile bodies. The new works, with equipment, will cost about $75,000.

The Twin Valley Motor Co., 216 Dibert Street, Johnstown, Pa., has awarded contract to Berkeville Brothers, for a two-story service building and repair works, 65 x 152 ft., to cost about $80,000.

The Carnegie Steel Co., Pittsburgh, has been granted a permit for dredging and other work on the Monongahela River at Wilson, for its proposed new coal storage plant, covering an area of about 3 acres, with facilities for storing about 2,000,000 tons of coal. Coal-handling machinery will be installed, including gantry crane, etc.

Herman C. Daniels will be president and manager of the Winner Gas Stove Co., Huntington, W. Va., recently incorporated with a capital stock of $50,000. A plant will be operated for the manufacture of gas stoves, heaters, etc. It will contract for stove castings, including burners, etc., for assembling at the local works.

The Sterling Coal Co., Cecil, W. Va., is planning to rebuild its tipple and electric power plant, recently destroyed by fire with loss estimated at $50,000.

Fire, May 17, destroyed a portion of the plants of the Standard Oil Co. and the Freedom Oil Works, East Wheeling, W. Va., with loss estimated at $200,000.

The Pocahontas Foundry & Machine Co., Keystone, W. Va., is planning to rebuild the section of its works recently destroyed by fire with loss in excess of $100,000.

To convert the machine shop at its Sharon, Pa., plant into a pressed steel department, the Savage Arms Corporation is disposing of several milling and cutting machines. H. H. Hearst is in charge of the new department. F. L. Pratt, formerly of the Parish-Bingham Co., Cleveland, is in charge of production. H. W. Blakeslee will continue as general manager.

The Slick-Knox Co., Sharon, Pa., is being reorganized and is erecting an addition to its plant at Wheatland to manufacture automobile forgings and frames. Later it may take up a wider range of commercial work as the capacity will be greatly enlarged.

Detroit

DETROIT, May 24.

The machine tool market is dull owing chiefly to the railroad situation, which has curtailed production to a little more than 50 per cent. The credit situation has also a part in preventing the purchase of new machinery, it is believed. About the only activity at present is that of purchasers who are trying to obtain deliveries of machines already bought.

The Pennsylvania Railroad Manufacturers' District has been organized in Detroit to develop an industrial district on the west side of the city where the Pennsylvania-Detroit belt line meets the Pere Marquette Railroad. The tract purchased by the organization is about six miles from the business district of Springwells. The Pennsylvania-Detroit Railroad has been granted a right of way through the property for its main line, while spur tracks will be laid for plants that locate there. William P. Bradley, Detroit, is president of the organization.

The Oliver Machinery Co. of Grand Rapids, Mich., which recently purchased the Grand Rapids Foundry Co., is making a number of changes and improvements in the plant and expects to extend the output. For the present, however, the new owner will restrict production to its own requirements.

R. E. Olds, president Reo Motor Co., Lansing, Mich., denies the reports recently published that any plans had been made for sale of the company.

The board of directors of the Canadian Pressed Metals Co., whose plant is being erected at Marysville, Mich., has decided to change the name of its American corporation to the Michigan Bushings Corporation. Work is progressing satisfactorily and it is expected that production will be started by July 1, when between 300 and 400 men will be employed. Two additional plant units will be started during the summer. It is said that practically the output of the company will be taken by Michigan manufacturers.

Construction has been started on the new unit of the Almont Mfg. Co., Almont, Mich., which will provide a floor space, 70 x 80 ft., with an addition, 25 x 25 ft., two stories, for cupola space, and double the present capacity. In addition to the new factory, which will turn out automobile castings, the company will manufacture a full line of plow repair parts and will build motor car bodies.

M. C. Roush, Jackson, Mich., has purchased the stock and equipment of the Wolverine Grinding Wheel Co. and is constructing a factory in Jackson. Mr. Roush holds a patent on a process for reconstructing worn-out emery wheels.

The Federal Sand & Gravel Co., Saginaw, Mich., is spending $50,000 for new machinery and equipment for a newly opened gravel pit.

At a meeting of stockholders of the Gifford Engine Co., Lansing, Mich., last week, W. A. Gifford was elected president; C. L. Anderson, Ann Arbor, Mich., vice-president; O. C. Bleed, secretary, and S. E. Lamb, treasurer. These, with Fred L. Bradford, comprise the board of directors.

The Detroit Graphite Co., Twelfth Street, Detroit, is having plans prepared for a two-story addition, brick and concrete, to cost about $50,000.

The Thurlow Titus Co., 66 Clark Street, Coldwater, Mich., manufacturer of iron castings, etc., is considering the erection of a one-story foundry, 60 x 100 ft., to cost about $40,000.

The General Metals Co., 895 Greenwood Avenue, Detroit, is considering the installation of new machine tools.

The General Machine & Tool Co., Liberty Street, Jackson, Mich., has awarded a contract to J. C. LaDuke, Jackson, for a one-story plant, 92 x 140 ft., to cost about $50,000. J. H. Meyers is president.

The Ewing Bolt & Screw Co., Farwell Building, Detroit, is arranging for the immediate erection of a one-story plant,

EMERGENCY USE OF A "TIER-LIFT" TRUCK FOR LOADING A LAKEWOOD TRACTOR WEIGHING 2 TONS UPON A DRAY. OTHER FACILITIES BEING LACKING, THE LAKEWOOD ENGINEERING CO., 141 CENTER STREET, NEW YORK, UTILIZED THE TRUCK WHICH, TOGETHER WITH THE TRACTOR HAD BEEN ON DISPLAY IN THE SALESROOM, TO FILL A HURRY ORDER FOR A TRACTOR RECEIVED FROM THE FARREL FOUNDRY & MACHINE CO., ANSONIA, CONN.

The Vulcan Motor Axle Co., Detroit, has been organized with a capital stock of $1,000,000, with F. C. Gilbert, president and treasurer; R. B. Weaver, Sidney C. Love and C. C. Miller, vice-presidents; J. T. Hanlon, secretary; R. G. Beechler, chief engineer. A plant has been obtained in the Milwaukee Junction manufacturing district in Detroit, to manufacture axles for motor vehicles. Machinery and equipment are being installed, and production will start in the early autumn.

Cincinnati

CINCINNATI, May 24.

Considerable inquiry is being received for machine tools for prompt delivery, but as many plants in this city are behind on deliveries and others are handicapped by a shortage of labor, owing to the machinists' strike, this business is not being placed here. The railroad situation, combined with the general conditions existing throughout the country, has also had some effect in the falling off in orders the past week. This is looked upon as only a temporary condition, however, as many manufacturers report orders are being booked for indefinite delivery and cancellation clauses eliminated. While none of the railroads which recently inquired for tools has up to this time taken any action, orders are expected to be placed by the Chesapeake & Ohio during the week. The St. Louis-San Francisco Railway has been a purchaser in this market the past week. The General Motors Corporation also has purchased a number of tools and is still in the market for some special machinery. While no cancellations are reported, one automobile company, which some time ago inquired for several tools, has decided not to purchase at this time. Although buying of machinery is not as brisk as in the first two months of the year, conditions are satisfactory and manufacturers do not see any cause for pessimism regarding the future.

The Ohio Tractor Co., Columbus, Ohio, has been incorporated with a capitalization of $500,000 by W. F. Garrett, D. W. Singleton, F. A. Miller, F. Copeland and A. T. Seymour.

A meeting of the stockholders of the Cincinnati Frog & Switch Co., Cincinnati, will be held June 16 to consider increasing the common stock from $100,000 to $200,000.

The National Chain Co., Marietta, Ohio, will increase its capital stock from $150,000 to $350,000.

The Dayton Ignition Co., Dayton, Ohio, has been incorporated by H. F. Sadgebury, J. C. Crigler, I. Warner, I. I. Haner and H. G. Kemper. It is capitalized at $100,000.

Fire, supposed to have originated from a spark from a passing locomotive, caused damage to the extent of $11,000 to the McDonald foundry on Liberty Street, Columbus, on May 17.

The Miami Engineering Co., Dayton, Ohio, recently incorporated with a capital stock of $50,000, has purchased the tool-making shop of the Marshall-Smith Co., at Fifth and Stone streets, and will install machinery to double the present capacity. L. R. Briggs is president.

The J. A. Oberhelman Foundry Co., Cincinnati, has commenced the erection of an extension to its foundry on Colerain Avenue. A new cupola is also being installed and will be ready for operation within a few weeks.

L. H. Brinkman & Co., Third and Montgomery streets, Dayton, manufacturers of tools, have completed plans for a two-story factory, 60 x 90 ft., to cost about $15,000.

Indianapolis

INDIANAPOLIS, May 24.

The Duesenberg Automobile & Motors Co., Inc., capitalized at $5,000,000 has bought 16½ acres at Washington and Harding streets, Indianapolis, on which a plant will be built to manufacture high-grade motor cars. The officers are: President, Newton Van Zandt, Logansport, Ind.; vice-president and general manager, L. M. Rankin, New York; secretary, F. A. Riley, New York; treasurer, Jacob Shafer, Brooklyn; chief engineer, Fred S. Duesenberg; assistant engineer, August Duesenberg; financial representative, R. L. Freudenberger, Cleveland. Mr. Duesenberg has had 22 years' experience in building engines, and operated a plant at Elizabeth, N. J., which was sold to the Willys Corporation. The Duesenberg motor will be manufactured at the Indianapolis plant as soon as contracts expire.

The A. L. Stone Road Machinery Co., Connersville, Ind., has been incorporated with $100,000 capital stock. The directors are A. L. and Charles K. Stone and A. A. Lease.

The Adaptable Tractor Co., Indianapolis, has been incorporated, with $100,000 capital stock, to manufacture tractors and other farm implements. The directors are F. F. Chandler, H. G. Myers and William M. Taylor.

The Sheridan Motors Co., a subsidiary of the General Motors Corporation, will build a factory at Muncie, Ind., to manufacture the Sheridan automobile. It will also use the former Inter-State Motor Co.'s plant.

E. C. Atkins & Co., saw manufacturers, Indianapolis, will erect a two-story brick factory, 50 x 133 ft., at Henry and Eddy streets, at an estimated cost of $60,000.

The Perfection Tire & Rubber Co., with plants at Wabash, Ind., and Des Moines, Iowa, has sold its Indiana plant to Mikesell Brothers, Chicago. P. J. Evans, vice-president, will remain with the new owner.

The Hartford Foundry Co., Hartford City, Ind., recently organized, has completed its organization by the election of

J. C. Miller, Montpelier, president; W. F. Lange, Muncie, vice-president, and J. P. Young, Muncie, secretary.

The Matthews-Banner Range Co., manufacturer of stoves, South Bend, Ind., has been reorganized with a capital stock of $200,000 by Louis C. and Daniel J. Matthews, South Bend, and Walter A. Mortenson, Cleveland. It succeeds the Banner Range Co., which recently went into the hands of a receiver.

The Cummins Engine Co., Columbus, Ind., is building an addition to be used as an assembling and testing department.

The Concrete Products Co. will build a plant at Yorktown, Ind. Besides cement products, it will manufacture a fence post machine. The organizers are W. W. Bailey, Malcolm Harriot, D. W. Bailey, Noble Catterlain and Roy Swank, all of Muncie, Ind.

The American Car & Foundry Co., Terre Haute, Ind., will erect a brick and steel power house at Tenth and Crawford streets, to replace the building destroyed by fire last fall. It will cost $200,000. It is reported that its foundry department, closed for many years, will be reopened, giving employment to about 250.

The Logansport Radiator Equipment Co., Logansport, Ind., will build an addition to its plant to cost $30,000.

The Wenger Mfg. Co. has been incorporated at Warsaw, Ind., with $50,000 capital stock, to manufacture wire products. The directors are Arthur W. Wenger, Joseph Fields and Claude M. Rogers.

The Brammer Tool, Die & Machine Co., Indianapolis, has changed its name to the American Tool, Die & Machine Co.

The Indiana Atomized Fuel Co., Evansville, Ind., has bought five acres near the Crescent coal mine and will build a plant for the manufacture of powdered coal.

The Metal Auto Parts Co., Indianapolis, has increased its capital stock from $100,000 to $1,000,000.

The Tokheim Oil Tank & Pump Co., Fort Wayne, Ind., has increased its capital stock from $400,000 to $700,000.

The Rotary Fan Swing Co., Evansville, Ind., has been incorporated, with $200,000 capital stock. The directors are Isaac W. Crabtree, Charles N. Garrett and Travis B. Williams.

The Terre Haute Atomized Fuel Co., Terre Haute, Ind., is having plans drawn for new works to cost about $400,000, including equipment.

The Richmond Air Compressor Co., Richmond, Ind., manufacturer of air compressors, etc., has taken bids for a one-story addition, 80 x 145 ft.

The Sheet Steel Products Co., Bryan, Ohio, manufacturer of agricultural implements, etc., is considering plans for a two-story building at Michigan City, Ind., 145 x 320 ft.

Chicago

CHICAGO, May 24.

The feature of the week just closed was the issuance of a large list by the Chicago, Rock Island & Pacific, supplementing smaller lists previously mentioned in this column. Three 90-in. locomotive driving wheel lathes, included in the inquiry, will alone entail an outlay of close to $100,000.

Rock Island List

One 100-in. boring and turning mill, motor driven.
One 48-in. vertical motor-driven boring mill.
Two belt-driven locomotive box and rod bushing hydraulic presses, 60 tons capacity.
Two 600-ton locomotive driving wheel presses.
Three 72-in. belt-driven radial drilling machines.
One 54-in. x 54-in. x 16-ft. planer, belt driven.
One belt-driven 36-in. x 36-in. x 12-ft. planer.
One belt-driven center drive double car axle lathe with 12-ft. bed.
One motor-driven portable 16-in. lathe.
One 48-in. steel-tired car wheel lathe, motor driven.
One 18-in. x 10-ft. belt-driven engine lathe.
Two 18-in. x 6-ft. belt-driven universal turret lathes for brass work.
Two belt-driven 36-in. x 14-ft. engine lathes.
One 36-in. upright drill press arranged for belt drive.
One belt-driven 45-in. vertical boring mill.
Three 90-in. locomotive driving wheel lathes arranged for motor drive.
Two combined boring and mortising machines, belt drive.
Two double punches and shears with 48-in. throats.

The Burlington has closed for a few machines in its list and is expected to order the remainder soon. Otherwise no action has been taken on any of the pending railroad inquiries. The General American Tank Car Corporation has purchased two axle lathes and two car wheel boring machines. The Ryan Car Co. is inquiring for a large multiple punch. An unconfirmed report is that the Nash Motors Co. has bought 18 automatic turret lathes.

The transportation situation is unimproved with the result that shipment by boat and motor truck is more common. It is not to be inferred, however, that the market is dead because of present shipping difficulties. A fair amount of business develops from day to day, although not in the volume of the early months of the year. Machines offered at auction at the Government warehouse here last week brought high prices in many cases, indicating that buyers will act when they are assured early delivery. In this connection it should be remembered that some of the best selling lines are sold ahead all the way from six months to a year. One prominent manufacturer cannot offer delivery before September and on certain of his machines can do no better than March, 1921.

Here and there cancellations have been received because buyers were unsuccessful in securing loans from their bankers. This development, of course, is to be expected in view of the tight money situation. The really surprising thing is that there have been so few cancellations.

The Central Steel & Wire Co., 127 North Paulina Avenue, Chicago, has purchased a site, 432 x 460 ft., at the corner of Western Avenue and Forty-fifth Street, and will construct a one and two-story warehouse, covering the entire lot, to cost $450,000.

The Chicago Steel Foundry Co., 3720 South Kedzie Avenue, Chicago, has let contract for the construction of a foundry, 102 x 141 ft., to cost $50,000.

The Hafner Mfg. Co., 648 North Robey Street, Chicago, has let contract for a one-story toy factory, 66 x 159 ft., at 3128-32 Carroll Avenue, to cost $40,000.

The Arex Ventilator Co., 111 West Washington Street, Chicago, has purchased a site for a plant on the west side of Broadway, between the New York, Chicago & St. Louis Railroad and Fortieth Avenue, Gary, Ind. A $10,000 factory building will be constructed at once.

The Gartland Foundry Co. has arranged for the construction of a foundry on the site of the old Chicago & Eastern Illinois Railroad shops at Danville, Ill.

The P. M. Lattner Mfg. Co., Cedar Rapids, Iowa, has been incorporated with $100,000 capital stock to manufacture machinery, automotive parts, hot water storage heaters, heating plants, etc. The officers are P. M. Lattner, president and treasurer; M. J. Donnelly, vice-president; B. P. Lattner, secretary.

The Furlong Iron & Boiler Co., Des Moines, Iowa, has leased the northeast corner of Fourth Street and Court Avenue for 50 years and will erect a boiler plant, 60 x 132 ft.

The Flint Foundry Co., Marshall, Mich., will erect an addition, 80 x 120 ft., to cost $60,000.

The 20-in. mill, the first of four mills to be erected by the Hoosier Rolling Mill Co., Terre Haute, Ind., is well under way. It is expected to be ready for occupancy within 90 days, when work on the second building will be started. The building now under construction will be 20 x 600 ft.

The Columbia Iron Works, Fort Wayne, Ind., plans the erection of a brass foundry, 40 x 60 ft.

The Pandolfo Mfg. Co., St. Cloud, Minn., manufacturer of metal folding tables, tractor fenders, gasoline tanks, luggage carriers and other articles of sheet metal and pressed steel, has completed a plant, 110 x 120 ft.

The Hardesty Mfg. Co., Denver, Col., manufacturer of corrugated iron products, has purchased a site, 140 x 150 ft., for a plant at Pocatello, Idaho.

Through acquisition of the Otis Elevator Co.'s property, Chicago, the Chicago Fuse Mfg. Co., which began 31 years ago, has now a total floor space of 125,000 sq. ft., with a frontage of 140 ft. on Eaflin Street and 360 ft. on Fifteenth Street, Chicago. The building is a two-story structure, with a four-story office section, protected throughout with sprinkler system.

The Superior Machine Co., DeKalb, Ill., will make extensions and improvements in its plant to cost about $100,000.

The Donald B. Howard Heater Co., Tenth and Murphy streets, Des Moines, Iowa, has completed plans for extensions and alterations in its plant to cost about $15,000.

Deere & Co., Third Avenue, Moline, Ill., manufacturers of plows and agricultural equipment, have completed plans for a number of buildings at Waterloo, Iowa, comprising a one-story foundry addition, 120 x 200 ft.; three-story general works, 120 x 120 ft.; two-story cupola building, 40 x 40 ft.; steel and reinforced concrete.

The State of Illinois Penitentiary, Joliet, Ill., has had plans prepared for a one-story power plant, 70 x 80 ft., to cost about $50,000. R. W. Zimmerman, 64 East Van Buren Street, Chicago, is architect; H. W. Tomlinson, Woodruff Building, Joliet, in charge.

The W. L. Frank Mfg. Co., Forty-fourth Street, Rock Island, Ill., manufacturer of electric fixtures, etc., has ar-

ranged for the immediate erection of a one-story plant, 90 x 108 ft., to cost about $50,000.

C. L. Gibolya, enamel chemist, recently of Los Angeles, Cal., has established himself at 2147 Tremont Street, Denver, Col., to build a porcelain enameling plant for making enameled table tops, stove parts, steel signs and cast iron enameled goods. His process, it is understood, involves a type of double fusing furnace which involves a single operation rather than two.

The Pacific Coast

SEATTLE, May 18.

The freight embargo from the East is proving a serious factor to business. A number of improvements in industrial plants have been held up indefinitely by the extreme uncertainty of machine tool deliveries and this condition is also hampering sales. Second-hand equipment is snatched up eagerly, but is scarce and high-priced.

Construction work has held up well since the first of the year, but threatens to be completely tied up by a proposed strike of building tradesmen, scheduled for next month. The main issue is the open shop, wages and hours having been adjusted satisfactorily. Labor is comparatively plentiful.

Some disappointment has been felt at the failure of the plans of David Rodgers, formerly general manager Skinner & Eddy Shipbuilding Corporation, to establish a large shipbuilding plant in Seattle. Financial backing was not forthcoming to handle the contracts for $40,000,000 worth of work obtained by Mr. Rodgers and the plan has been abandoned.

The Mars Mfg. Co., manufacturer of Mars truck attachments, has moved its plant from Seattle to Yakima, where a one-story brick building has been erected. The equipment of the plant will be augmented.

The Brooks-Scanlon Lumber Co., Bend, Ore., contemplates the erection of a new burner at its plant and the installation of other equipment, totaling more than $45,000. Work will start immediately.

The plant of Healy Brothers, Portland, Ore., furniture manufacturers, was recently damaged by fire to the extent of $75,000.

J. W. Bieger and Walter Sinclair, Kelso, Wash., formerly of Grand Rapids, Mich., plan the establishment of a veneer factory. A site has been obtained and construction will start immediately.

The Medford Planing Mill, Medford, Ore., recently organized for $15,000, will establish a plant for the manufacture of furniture and mill work.

The Power Construction Co., San Francisco, recently organized to manufacture structural steel products, has secured two and one-half acres between the Pacific Coast Steel Co's. mill and the Virden Packing Co.'s plant in South San Francisco, where a factory will be erected to cost approximately $35,000 with equipment.

The National Engineering & Dry Dock Corporation, Sacramento, has been incorporated with a capital stock of $500,000 by George W. Ley, Max L. Gordan and Abe Raffee, all of Los Angeles, and Roy Atkinson, Santa Monica. It plans to build and repair ships and engage in a general engineering business. It is not stated where the plant will be located.

The Golden West Specialty Co., Stockton, has been incorporated with a capital stock of $50,000 by E. M. Hansley, J. G. Lyons and D. D. Schneider, to manufacture novelties.

The Pacific Car Building Co., Russ Building, San Francisco, has awarded a contract to the Unit Construction Co., Phelan Building, for a new plant at Woodland, to cost about $225,000. Two reinforced-concrete buildings will be erected, 160 x 508 ft., and a two-story building, 40 x 160 ft.

The General Battery Mfg. Co., Los Angeles, has been incorporated with a capital of $150,000 by B. S. Young, Everett E. Eldridge and Arthur E. Boland, to manufacture electric batteries.

Officials of Reclamation District No. 8, Woodland, Cal., are arranging for the immediate erection of a steam-operated, electric power plant in the vicinity of Knight's Landing, to cost about $80,000.

The American Can Co., Mills Building, San Francisco, is having plans prepared for a reinforced-concrete plant at Portland, Ore.

The Whalen Electrical Appliance Co., 802 South Grand Avenue, Los Angeles, has been organized to manufacture electrical specialties. John M. Whalen, 1130 South Hope Street, heads the company.

The Porter-Brown Auto Body Co., Los Angeles, has been incorporated with a capital of $75,000 by F. H. Brown, G. E. Porter and L. J. Wagner, to manufacture automobile bodies.

The Perfection Tire Co., Fort Madison, Iowa, is considering tentative plans for the erection of a new automobile tire manufacturing plant on a site in the vicinity of Los Angeles.

The Byron-Jackson Iron Works, New Montgomery Street, San Francisco, manufacturer of centrifugal pumps, etc., has awarded contract to George Wagner, 251 Kearny Street, for a new plant in the Huntington Park section, Los Angeles, to cost about $75,000.

The Sierra Aircraft Co., Pasadena, Cal., has been incorporated with a capital of $50,000 by Leon T. Eliel, Pasadena, and Walter W. Alley, Sierra Madre, to manufacture airplanes and parts.

An electric power plant, steam-operated, will be erected in connection with the new plant of the Carbasemo Co., Los Angeles, at Burbank, Cal., estimated to cost about $200,000 complete. It will be used for soap production and machinery will be installed with individual motor drive. H. J. Knauer, 1129 Story Building, is architect.

The Universal Steel Wheel Co., Santa Ana, Cal., is arranging for the erection of a plant in the vicinity of Newport Beach, Cal. It has recently been organized with a capital stock of $100,000. E. D. Burge is president.

The Vonder Kuhlen Electric Co., Los Angeles, has been incorporated with a capital stock of $20,000 by H. L. Vonder Kuhlen, 917 Georgia Street, and W. J. Barman, to manufacture electrical specialties.

The California Pipe & Well Tool Co., 2954 West Pico Street, Los Angeles, has been organized to manufacture oil well machinery, etc. G. R. Wilson, 1312 Girard Street, heads the company.

The Gulf States

BIRMINGHAM, May 24.

The new oil refinery of the Great Southern Producing & Refining Co., Indianapolis, Ind., to be erected near Shreveport, La., will include a machine shop 40 x 200 ft.; boiler plant, 50 x 128 ft.; electric power plant; pumping plant, 30 x 60 ft.; can manufacturing works, 40 x 400 ft.; tank department and a number of other structures. The plant will have a daily capacity of 12,000 bbl., and is estimated to cost close to $2,000,000, including equipment. J. E. A. Moore, Euclid Building, Cleveland, Ohio, is construction engineer. W. J. Hungate is secretary-treasurer and general manager.

The Petroleum Tank Co., Houston, Tex., manufacturer of oil tanks, etc., has increased its capital stock to $100,000.

Fire, May 10, destroyed a portion of the plant of the Houston County Oil Mill & Mfg. Co., Crockett, Tex., with loss estimated at $100,000.

The Lone Star Culvert Co., Houston, Tex., has been organized to manufacture metal culverts, etc. F. W. Seward and C. L. Gregory head the company.

The Arkansas Light & Power Co., Little Rock, Ark., is planning for the erection of a new electric power plant in the vicinity of Russellville, with initial capacity of about 25,000 kw. H. C. Couch is president.

The Doullutt & Williams Shipbuilding Co., New Orleans, is planning for the erection of an extension to the machine shop, with new equipment, steel fabricating shop and other buildings for ship repair and construction. Two 10,000-ton floating drydocks will also be built. Horace Williams is secretary.

The Clarendon Light & Power Co., Clarendon, Tex., recently organized with a capital stock of $200,000, is arranging for the erection of an electric power plant.

The Farmers' Oil & Refining Co., Texarkana, Tex., has completed plans for a new refinery, comprising eight buildings, with a daily capacity of about 3000 bbl.

The Rayford Sawmill & Gin Co., Rayford, Tex., has been incorporated with a capital of $10,000, by W. S. Singleton, E. R. Palmer and T. Singleton.

The Galena-Signal Oil Co. of Texas, with headquarters at Houston, has increased its capital stock from $6,000,000

to $7,500,000. It operates a refinery at Galena, which will be enlarged.

Plans have been adopted by owners of 13,000 acres of land near Harlingen for creating an irrigation district and the construction of a canal and ditch system. J. E. Couch, W. D. Oliver and L. F. Ladd of Harlingen are interested in the project.

P. W. Maer, Progress Building, Columbus, Miss., is in the market for ice plant and refrigeration machinery.

The McNerny Motor Air Brake Co., Miami, Fla., has been incorporated with $100,000 capital stock, to manufacture air brakes for motor vehicles. C. J. McNerny is president and J. H. Twaddell secretary.

Quotations on 10- to 15-ton locomotive cranes are desired by the Consumers' Dyewood Products Corporation, Mobile, Ala.

The Central South

ST. LOUIS, May 24.

The Fortified Mfg. Co., 220 Gumbel Building, Kansas City, Mo., manufacturer of electric heating devices, has completed arrangements for a one-story and basement plant, 40 x 82 ft., at 1401-3 Agnes Avenue.

The American Screw-Set Co., Tenth and Saballe streets St. Louis, manufacturer of tools, is planning for the erection of a new two-story plant, 40 x 100 ft., to cost about $35,000. The equipment will include machine tools, punches, presses, heat-treatment apparatus, etc. James E. Mills is president and manager.

The Hagen Metal Products Co., Detroit, Mich., has awarded a contract to John Blach, 4389 Laclede Avenue, St. Louis, for a one-story plant at 117 Bowen Avenue, St. Louis, 40 x 140 ft., to cost about $15,000.

The Security Fire Door Co., St. Louis, recently organized to manufacture metal doors, sash, etc., has leased a two-story building comprising about 10,000 sq. ft. J. A. Schweig is president.

B. F. Avery & Sons, Louisville, Ky., who recently increased their capitalization from $2,300,000 to $6,000,000, is understood to have purchased the business, good-will and name of the Champion line of agricultural machinery, now being built in Springfield, Ohio, and will shortly commence the manufacture of these machines in Louisville.

The Shawnee Metal Mfg. Co., Shawnee, Okla., has increased its capital stock by $40,000 to add new equipment.

The Traffic Motor Truck Corporation, St. Louis, will build an addition for the manufacture of axles and steering gear parts for motor trucks.

H. Moser, Versailles, Mo., will install a 130-hp. electric motor and other machinery in his plant.

The Kentucky Tire & Rubber Association, Louisville, Ky., is still in the period of financing, which is progressing rapidly, and it expects to begin building operations within the next two weeks, having purchased a 10-acre factory site in Louisville at a cost of $18,500. It has contracted for practically all the machinery and equipment to be installed in the first unit, and expects to be in full operation at the end of four months.

The Haren Tank Co., Tulsa, Okla., has been ihcorporated in Delaware with a capital stock of $250,000 by J. A. and L. B. Haren and C. H. Loop, to manufacture steel tanks and kindred products.

The plant of the Louisville Steel & Iron Co., Louisville, Ky., has been acquired by new interests. Additions to cost in excess of $200,000 are planned.

Swift & Co., Union Stock Yards, Chicago, have had plans prepared for a one-story engine plant at their works at St. Louis, to cost about $100,000, including equipment.

The Mutual Oil & Refining Co., 301 Security Trust Building, Lexington, Ky., has completed plans for a new refinery at Winchester, Ky., to cost about $150,000. C. L. Bell is president.

The Chicago, Rock Island & Pacific Railroad Co., Chicago is planning to rebuild its shops and engine house at El Dorado, Ark., damaged by fire recently with loss reported at $100,000.

The Morris Fertilizer Co., Morristown, Fla., is contemplating the erection of a new plant to cost about $200,000.

The Board of Trustees, Tahoka, Tex., is planning for the erection of a municipal electric lighting plant to cost about $15,000.

The National Basic Fertilizer Co., Huntsville, Ala., recently organized, is arranging for the erection of a plant. H. C. Laughlin is treasurer and T. W. Pratt, manager.

Canada

TORONTO, May 24.

The Atlas Mfg. Co., Port Arthur, Ont., manufacturer of electrical supplies and equipment, automobiles, etc., has recently purchased property on Ambrose Street and is remodeling a building on the site. It also intends to erect a four-story brick structure for which machinery will be purchased. W. L. McGregor is president; A. G. Day, vice-president and A. C. Latoski, secretary and general manager.

The Elliott & Whitehall Machine & Tool Co., Galt, Ont., will start work at once on the erection of a plant on a site of two acres at the corner of Dundas and Beverly streets, where it will manufacture its line of milling cutters and small tools, metal stamping dies, jigs and fixtures. It is expected that the plant will be in operation by next September.

The Draper Mfg. Co., Port Huron, will re-open and enlarge its plant at Petrolia, Ont., which was closed some time ago. It manufactures valve facing tools, ball check valves, ball globe valves, balanced brass balls, etc. Operations are expected to begin in about two months.

Beatty Brothers, Fergus, Ont., manufacturers of stable equipment, pumps, washers, etc., have increased their capital stock from $750,000 to $2,000,000 to provide additional capital to take care of increased business. It is the intention of the company to spend this year about $150,000 on additions and machinery. About 70,000 sq. ft. of floor space is being added to the Fergus plants and improvements are under way at the plants at London, Ont.

The Canada Metal Co., 35 Fraser Avenue, Toronto, is in the market for a 15-hp. electric motor, 750 r.p.m., 550 volt, three-phase, 25 cycle.

H. E. Givan, Ltd., Toronto, has been incorporated with a capital stock of $75,000 by James S. Lovell, 25 King Street West; Ernest H. Stewart, 354 Howland Avenue; William Bain, 189 College Street, and others to manufacture automobiles, trucks, tractors, motors, engines, etc.

An addition is being made to the Angus, Que., car shops of the Canadian Pacific Railway and new machinery will be installed. The total cost will be approximately $1,000,000.

John Hall & Sons, Brantford, Ont., will build an addition for the manufacture of pipe machinery. New equipment will be installed to take care of the new line.

Bids will be called in the near future for the erection of a factory at Woodstock, Ont., to cost $200,000 for the Brunswick-Balke-Collender Co. of Canada, Toronto. B. H. Prack, 50 Bay Street, Toronto, is the architect and engineer.

The Sherbrooke Machinery Co., Randrell Street, Sherbrooke, Que., has awarded the general contract to the Loomis Construction Co. 7 Belvidere Street, for an addition to its machine shop to cost $26,000.

Bert Marsh, Auburn, Ont., will rebuild his sawmill recently destroyed by fire and is asking for prices on equipment.

The factory of the Alberta Motor Boat Co., Edmonton, Alta., was destroyed by fire with a loss of $25,000. The company will rebuild at once and will shortly be in the market for equipment. J. W. Weir and J. Buchanan are interested.

A. S. MacGregor, Georgetown, P. E. I., is interested in the construction of a marine railroad and the construction of a floating or dry dock there. Information is desired on details and costs.

The Three Rivers Shipyard Co. and the National Shipbuilding Co., Three Rivers, Que., will start work at once on the reconstruction of blacksmith and machine shops recently destroyed by fire, to cost $20,000. New equipment will be required. L. Abbe is purchasing agent.

Simmons, Ltd., Montreal, is having plans prepared for the erection of a factory at London, Ont., to cost $250,000. Gordon Philip, Chamber of Commerce, London, Ont., is interested.

The officers and directors of the Dominion Engineering Works, Ltd., Montreal, recently incorporated are: G. H. Duggan, president; A. J. Brown, K. C., and Julien C. Smith, vice-presidents; R. Montague Davis, secretary-treasurer; W. F. Angus, George Cahoon, Jr., Sir Herbert S. Holt, Phelps Johnson, J. M. McIntyre, Howard Murray, H. Birchard Taylor, F. L. Wanklyn are directors.

The Berliner Gramaphone Co., St. Antoine Street, Montreal, has awarded contracts for the erection of a factory costing $400,000. The Atlas Construction Co., 37 Belmont Street, has the contract.

Cambria Company's Nineteenth Report

The total net earnings of the Cambria Steel Co., after operating expenses, repairs, maintenance and Federal taxes, amounted to $6,869,803, compared with $16,935,246 in 1918. The net income for the year amounted to $4,175,665, against $7,567,535 the year before, and this latter figure was less than one-third the corresponding figure for either 1917 or 1916. There was added to the surplus in 1919 $125,665, making the consolidated surplus at Dec. 31, 1919, $67,942,621. Expenses of operation, repair, maintenance and taxes amounted to approximately $9,000,000 in 1919, compared with $20,170,000 the year before.

The following work was completed during the year: Cambria works—replacement of Coopersdale pumphouse; new hopper, seal rings, bell and cylinders, No. 6 blast furnace; relined blast furnaces Nos. 2, 3, 5 and 6. Franklin works—reservoir and circulating system; coke plant; new ingot stripping plant; 1500-ton gas coal bin; relined No. 9 blast furnace. Gautier works—new disc spinning machine. Mines and quarries—air shaft and coal well at Elk Run; electrification of rolling mill mine. Miscellaneous—25 additional dwellings near Saltsburg mine; five additional dwellings at Mill Creek, rolling mill mine; 42 additional dwellings near wheel plant; store building at Saltsburg mine.

Otis Steel Co. Earnings

The first annual report of the Otis Steel Co. since its acquisition of the Cleveland Furnace Co. shows a balance available for dividends on the common stock for 1919 of $992,862, equivalent after preferred dividends to $1.91 a share. Net sales amounted to $16,285,329; net income after selling costs, administrative and general expenses was $1,556,084. There was a net profit of $992,868 after deductions for depreciation and Federal taxes. Net earnings for the first three months of 1920 were $1,089,118 before Federal taxes, or depreciation and other charges, equivalent to an annual rate of over $5.60 a share.

The Hess-Schenck Co., Cleveland, has been incorporated to engage in dealing in new and second-hand machinery, and has purchased from D. M. Osborne the business of the D. M. Osborne Machinery Co., 221 St. Clair Avenue. The new company is composed of C. N. Hess, for a number of years manager of the new and second-hand machinery department of the Patterson Supply Co., Cleveland, and Chas. F. Schenck, formerly vice-president of the Biggs-Waterson Co., Cleveland, and for the past year engaged in dealing in machinery and cranes, with offices in the Engineers' Building. The new company has a capital stock of $100,000.

The Lansing Stamping & Tool Company, Lansing, Mich., has notified stockholders that the board of directors has authorized a stock dividend of 50 per cent, to be paid July 1 to holders of record on June 15. The company was organized six years ago, and paid a six per cent cash dividend a year ago in December. The company makes a specialty of steel stampings, steel products, steel dies and tools. It also manufactures an internal grinder.

Undistributed earnings of the Falcon Bronze Co., Youngstown, Ohio, will be turned over to shareholders in the form of a 600 per cent stock dividend on the originally authorized capital of $25,000. To effect such disbursement the company has increased its capital to $300,000, of which $150,000 will be used for stock distribution purposes. The company is erecting an additional plant on its site. It manufactures bronze for mill bearings and other uses in steel plants.

The construction of an additional battery of coke ovens is proposed by the Dominion Steel Corporation, Sydney, N. S. The company plans to build a 60-oven coke plant, at a cost of approximately $3,000,000. The existing coke plant of the company consists of 120 ovens, which were put into operation last year, the construction of which involved an expenditure of $5,000,000.

Industrial Finances

At a meeting of the board of directors of the Hillman Coal & Coke Co., held in its general offices in Pittsburgh, May 11, it was resolved that the capital stock of the company, now $9,800,000, consisting of $3,800,000 of 5 per cent preferred stock and $6,000,000 common stock, be increased to $33,800,000. The proposed increase is to consist of 200,000 shares of 7 per cent cumulative preferred stock, having a par value of $100 per share, and 40,000 shares of common stock of a par value of $100 per share.

Stockholders of the Pittsburgh Valve, Foundry & Construction Co. will meet at its office in Pittsburgh on Thursday, July 1, for the purpose of voting for or against an increase in the common capital stock of the company.

The Kittanning Iron & Steel Co., which operates the Rebecca blast furnace, Kittanning, Pa., has increased its capital from $400,000 to $1,000,000, and has declared a stock dividend of 150 per cent. The controlling interest in this furnace is owned by the Carbon Steel Co., Pittsburgh.

A meeting of the stockholders of the Pittsburgh Steel Co., Union Arcade, Pittsburgh, will be held July 20, to vote on an increase in common stock from $7,000,000 to $14,000,000. This will bring the capital to $24,500,000, there being $10,500,000 preferred. If the increase is approved, a vote will be taken on the declaration of an additional common stock dividend, each holder of common stock to receive an additional share. No stock transferred after May 2 will be entitled to vote.

The Blaw-Knox Co., Pittsburgh, works at Hoboken, Pa., is offering $2,000,000 of its preferred stock, to bear 7 per cent cumulative interest. Upon the completion of its present financing, the company will have authorized $3,000,000 preferred stock, of which $2,000,000 is outstanding, and will have authorized $9,000,000 of common stock at $25 par value, of which $2,729,800 will be outstanding.

The Falcon Bronze Co., Youngstown, Ohio, has declared a stock dividend of 600 per cent, and will increase its capital from $25,000 to $300,000. The amount to be divided between stockholders in stock is $150,000. The company makes bronze bearings and is doing a large business.

Stockholders of the Pittsburgh Steel Co. will meet in its offices in the Union Arcade, Pittsburgh, July 1, to vote on an increase in common stock from $7,000,000 to $14,000,000.

To make its capitalization more fully conform to assets, the Continental Supply Co., western selling agency for the Youngstown Sheet & Tube Co., has increased its capital from $2,000,000 to $5,000,000. Headquarters of the subsidiary are maintained in St. Louis. It is credited with doing a gross business of $25,000,000 in oil-well supplies during the past year in southwestern and midcontinental oil territory.

Current assets of the Detroit Pressed Steel Co. are shown by the financial statement of the company as of December 31, 1919, just filed with the secretary of the Detroit Stock Exchange, to total $2,036,691.97, as against liabilities of $442,443.86. Total assets are $5,121,960.32. The company's capital stock outstanding consists of $1,494,300 of preferred and 76,230 shares of common stock of no par value.

The Engineering Advertisers' Association, Chicago, was addressed on May 11 by William Bethke, secretary and editorial director of the LaSalle Extension University and president of the Executives Club of Chicago, who discussed "What Makes Advertising Effective for the Engineering Advertiser?" Mr. Bethke emphasized the importance of giving positive and dependable data regarding the product or service advertised. W. Frank McClure gave a brief history of the National Advertising Commission, of which he is chairman, and which was organized about ten years ago to bring advertising to a high standard of dependability and efficiency.

NEW TRADE PUBLICATIONS

Metallurgical Furnaces.—Fuller Engineering Co., Allentown, Pa. Bulletin 300. Deals with metallurgical furnaces for annealing and heat-treating, including underfired designs of continuous, car, stationary hearth, table and ball types; endfired design, floor type, designed for annealing sheets with pulverized coal as fuel; overfired designs for oil or gas fuels only, including car and pusher types. The underfired designs include furnaces for pulverized coal but in which oil and gas fuel can be used with a slight change of flues.

Grinding Wheels and Machinery.—L. Best Co., 28 West Broadway, New York. Catalog, 144 pages, 6 x 9 in. Illustrates and describes abrasive dies and cloth, grinding machinery, polishing machinery, grinding wheel dressers, polishing supplies and abrasive grains.

Hot Process Water Softener.—H. S. B. W.-Cochrane Corporation, Seventeenth Street and Allegheny Avenue, Philadelphia. Catalog 933, 64 pages, 6 x 9 in. Devoted to the Sorge-Cochrane water softener which treats the water hot, explained as resulting in more complete removal of scale and mud forming substances. The effect of heat upon the reactions is explained in detail, and analyses of water before and after treatment in softeners in various plants are given. A sand filter is illustrated and described and numerous half-tones show installations of the water softener in customers' plants.

Laboratory Supplies.—Mine & Smelter Supply Co., 42 Broadway, New York. Folder. Illustrations and descriptions of laboratory supplies, including a two-muffle furnace, clay goods, laboratory concentrating table, flotation machine, low pressure oil burner, powdered coal unit, laboratory crusher, Heusser balance and McCool pulverizer.

Centrifugal Pumps.—De Laval Steam Turbine Co., Trenton, N. J. Bulletin S. Deals with De Laval centrifugal pumps for sugar house service. The bulletin is illustrated. Both motor and turbine-driven pumps, single-stage and multi-stage are shown.

Clutches.—Hill Clutch Co., Cleveland, Ohio. Bulletin 12. Devoted to clutch equipment. Illustrations show clutches driving a battery of oil pumps and air compressors. The pumps together with two air compressors are arranged in two rows, one each side of the central line shaft from which all are driven through silent chain connections. The clutches are installed in the line shaft, one for each pump and each compressor.

Anti-Corrosion Processes.—National Tube Co., Pittsburgh, Pa. Pamphlet. A reprint of an article on "Anti-corrosion Engineering," by Prof. H. Walker, director Division of Industrial Research, Massachusetts Institute of Technology, published in the *Scientific American*. The article deals with two recent advances in anti-corrosion engineering, first, a process for eliminating the mill scale from the inside of steel pipe; second, a process for removing the dissolved oxygen from feed water for boilers or hot-water supply systems.

Handbook of Safety Equipment.—F. W. King Optical Co., Cleveland. Catalog 12. Illustrates and describes the company's line of goggles, helmets and face masks for men engaged in various lines of industrial work. Several pages are devoted to the subject of effective means for eye protection.

Tapping Machines.—St. Louis Machine Tool Co., 932 Loughborough Avenue, St. Louis. Leaflet. Illustrates and describes tapping machines and tapping chucks. The company announces that it is equipped to heat treat and grind the gears and clutches used in its tapping chucks.

Calendar.—Bay City Industrial Works, Bay City, Mich. Comprises 12 pages, each 15½ x 21 in. and bearing a one month's calendar. Views are shown of locomotive cranes at work in industrial plants, in bridge building and steel erection work, handling coke from cars to storage, building piers with concrete blocks, shipbuilding, handling scrap with a lift magnet, etc. A specially built electrically operated crane and a gasoline operated crane are also shown.

Steam Separator.—Griscom-Russell Co., 90 West Street, New York. Bulletin 1140. Illustrations and descriptions of the Stratton steam separator to be installed in the steam line close to the engine or turbine for stopping and collecting water, whether entrained moisture or in large quantities, also scale, grit, bits of packing, etc.

Ash Pit Doors.—American Steam Conveyor Corporation, 110 West Fortieth Street, New York. Blotter. A half-tone with text describes an ash pit door featured as being air-tight.

Hand and Power Pumps.—Deming Co., Salem, Ohio. Catalog 26, 254 pages, 6¼ x 9½ in., with cloth cover. Devoted to an extensive line of hand and power pumps, including lift and force pumps, centrifugal and rotary pumps, triplex power pumps, horizontal double action power pumps, miscellaneous hand and power pumps. Hydro-pneumatic water systems and spray pumps and accessories are included. Technical data and engineering tables giving facts, formulæ and rules relating to hydraulics and pneumatics, including capacities, power and speed of pumps, and their operating factor, are given.

Industrial Lighting.—Benjamin Electric Mfg. Co., Chicago. Bulletin 17, 87 pages, 7⅝ x 10½ in. Illustrations with descriptions of reflectors and fixtures for industrial lighting. Practical information and complete data for applying the principles laid down by illuminating engineers as the best practice in the lighting of buildings and areas devoted to industrial uses are given.

Shredders.—Jeffrey Mfg. Co., Columbus, Ohio. Catalog 259. Describes the Jeffrey type E swing hammer shredder for reducing wood chips, bark and other fibrous materials. Numerous photographs show details of the shredders and various applications.

Bolt, Nut and Special Machinery.—Howard Iron Works, Buffalo, N. Y. Catalog, 55 pages, 7¾ x 11 in. Illustrates and describes machinery for the manufacture of bolts and nuts, also special machinery, including bar heating furnaces, forges for heating the ends of bars, carbon electrode molds and cast-iron annealing retorts, expansion joints, metal goods pickling and washing machine, gears and transmission equipment, shaft hangers, etc.

OFFICE CHANGES

Announcement is made of the consolidation of the executive and sales offices of the Booth Electric Furnace Co., Chicago, at the same address as the engineering and production office, which has been located at 326 West Madison Street. The district sales offices of the company now are Edward B. Stott & Co., 175 Fifth Avenue, New York; Northern Engineering Co., 308 Chestnut Street, Philadelphia; Chas. L. Foster, 879 The Arcade, Cleveland, Ohio; M. A. Beltaire, Jr., 805 Hammond Bldg., Detroit; Gassman & Cunningham, Brown-Marx Bldg., Birmingham, Ala.; Buckeye Products Co., 919 West Fifth Street, Cincinnati.

The Page Steel & Wire Co. has changed its central district sales office from 29 South La Salle Street to 208 South La Salle Street, Chicago, telephone Harrison 9776.

Paul J. Mallmann, consulting engineer and chemist, is now located at 49 Liberty Street, New York.

The executive offices of the Pittsburgh Crucible Steel Co., a subsidiary of the Crucible Steel Company of America, have been removed from Empire Building to Oliver Building, Pittsburgh.

The Newton Steel Co., Newton Falls, Ohio, recently opened an office in the People's Gas Building, Chicago, under the managership of J. L. Harrison.

Since the purchase of the Skillin & Richards Mfg. Co. by the Webster Mfg. Co., Tiffin, Ohio, a new building has been erected which will increase the capacity of that plant about 50 per cent. Receiving and shipping facilities have been improved and a sprinkler system installed. The sales office in the McCormick Building and the general offices and engineering staff, at Tiffin, now occupy the new office building at 4500 Cortland Street, Chicago.

L. Brandenburger, formerly located in the Walker Bank Building, Salt Lake City, has taken over larger quarters at 59 West Broadway, that city. He was recently appointed sales representative for the Cutler-Hammer Mfg. Co. for Utah, the western section of Wyoming, and three-quarters of Idaho.

Briggs & Turivas, iron and steel dealers, have moved from 347 Madison Avenue to room 1508, 2 Rector Street, New York.

Effective May 21, Ransome Concrete Machinery in the Atlanta territory will be sold by W. F. Goodrich & Bro., with offices at 10½ Auburn Avenue, Atlanta, Ga. For several years W. F. Goodrich has been connected with the Ransome line in that territory. He has recently severed his connection as president of the Piedmont Motor & Machinery Co. and together with his brother has gone in business for himself. James Goodrich, the other member of the firm, is an experienced engineer and will look after this side of the business. In addition to the Ransome line, they will handle a general line of equipment such as hoisting engines, crushers, forms, etc.

Current Metal Prices

On Small Lots, from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manfacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general headings of "Iron and Steel Markets" and "Metal Markets."

Iron and Soft Steel Bars and Shapes

	Per lb.
Bars:	
Refined iron, base price	5.25c.
Swedish bars, base price	20.00c.
Soft Steel:	
¾ to 1⅞ in., round and square	3.52c. to 5.25c.
1 to 6 in. x ⅜ to 1 in.	3.52c. to 5.25c.
1 to 6 in. x ¼ to 5/16	3.62c. to 5.25c.
Rods—⅝ and 11/16	3.57c. to 5.05c.
Bands—1½ to 6 by 3/16 to No. 8	4.22c. to 6.50c.
Hoops	5.57c. to 6.50c.
Shapes:	
Beams and channels—3 to 15 in.	3.47c. to 5.25c.
Angles:	
3 in. x ¼ in. and larger	3.47c. to 5.25c.
3 in. x 3/16 in. and ⅛ in.	3.72c. to 5.60c.
1½ to 2½ in. x ⅛ in.	3.52c. to 5.90c.
1½ to 2¾ in. x 3/16 in. and thicker	3.47c. to 5.85c.
1 to 1¼ in. x 3/16 in.	3.52c. to 5.90c.
1 to 1¼ x ⅛ in.	3.57c. to 5.95c.
⅞ x ⅞ x ⅛ in.	3.62c. to 6.00c.
¾ x ⅛ in.	3.67c. to 6.05c.
⅝ x ⅛ in.	4.07c. to 6.85c.
½ x 3/32 in.	5.17c. to 7.55c.
Tees:	
1 x ⅛ in.	3.87c. to 6.25c.
1¼ in. x 1¼ x 3/16 in.	3.77c. to 6.15c.
1½ to 2½ x 3/16 in. and thicker	3.57c. to 5.95c.
3 in. and larger	3.52c. to 5.30c.

Merchant Steel

	Per lb.
Tire, 1½ x ½ in. and larger	5.00c. to 5.25c.
Toe calk, ½ x ⅜ in. and larger	6.00c.
Cold-rolled strip (soft and quarter hard)	12c. to 14c.
Open-hearth spring steel	7.00c. to 10.00c.
Shafting and Screw Stock:	
Rounds	6.25c. to 7.00c.
Squares, flats and hex	6.75c. to 7.50c.
Standard cast steel, base price	15.00c.
Best cast steel	20.00c. to 24.00c.
Extra best cast steel	25.00 to 30.00c.

Tank Plates—Steel

	Per lb.
¼ in. and heavier	3.67c. to 5.50c.

Sheets

Blue Annealed

	Per lb.
No. 10	6.62c. to 8.00c.
No. 12	6.67c. to 8.05c.
No. 14	6.72c. to 8.10c.
No. 16	7.82c. to 8.20c.

Box Annealed—Black

	Soft Steel C.R., One Pass per lb.	Wood's Refined, per lb.
Nos. 18 to 20	7.80c. to 9.90c.	
Nos. 22 and 24	7.85c. to 9.85c.	9.80c.
No. 26	7.90c. to 9.90c.	9.85c.
No. 28	8.00c. to 10.00c.	10.00c.
No. 30	8.10c. to 10.10c.	

No. 28, 36 in. wide, 10c. higher.

Galvanized

	Per lb.
No. 14	8.25c. to 10.50c.
No. 16	8.50c. to 10.75c.
Nos. 18 and 20	8.65c. to 10.90c.
Nos. 22 and 24	8.80c. to 11.05c.
No. 26	8.95c. to 11.20c.
No. 27	9.10c. to 11.35c.
No. 28	9.25c. to 11.50c.
No. 30	9.75c. to 12.00c.

No. 28, 36 in. wide, 20c. higher.

Pipe

Standard—Steel	Blk.	Galv.	*Wrought Iron*	Blk.	Galv.
½ in. Butt...	—36	—19	¾-1½ in. Butt.	—15	+ 5
¾-3 in. Butt.	—40	—24	2 in. Lap.....	— 7	+11
3½-6 in. Lap.	—35	—20	2½-6 in. Lap..	— 9	+ 7
7-12 in. Lap..	—25	— 8	7-12 in. Lap...	+ 2	+20

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER	Per lb
Bright basic	8.00c.
Annealed soft	8.00c.
Galvanized annealed	8.50c.
Coppered basic	8.50c.
Tinned soft Bessemer	10.00c.

*Regular extras for lighter gages.

Brass Sheet, Rod, Tube and Wire

BASE PRICE	
High Brass Sheet	28¼c. to 29½c.
High Brass Wire	28¼c. to 29½c.
Brass Rod	26¾c. to 29 c.
Brass Tube	42½c. to 44½c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 29½c. per lb. base.

Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

Tin Plates

Bright Tin	Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20
IC	$16.50	$14.25
IX	18.75	16.25
IXX	20.50	18.00
IXXX	22.25	19.75
IXXXX	23.75	21.50

Coke—14x20	Primes	Wasters
80 lb.	11.80	11.55
90 lb.	11.90	11.65
100 lb.	12.00	11.75
IC	12.25	12.00
IX	13.25	13.00
IXX	14.25	14.00
IXXX	15.25	15.00
IXXXX	16.25	16.00

Terne Plates

8-lb. Coating 14x20

100 lb.	$9.35
IC	9.50
IX	10.50
Fire door stock	12.75

Tin

Straits pig	59c.
Bar	68c. to 68c.

Copper

Lake ingot	21c. to 22c.
Electrolytic	20c. to 21c.
Casting	19½c. to 20c.

Spelter and Sheet Zinc

Western spelter	10c. to 11c.
Sheet zinc, No. 9 base, casks	14½c. open 15c.

Lead and Solder*

American pig lead	10c. to 11c.
Bar lead	11c. to 12c.
Solder ⅛ and ½ guaranteed	42c.
No. 1 solder	39c.
Refined solder	35c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	90c.
Commercial grade, per lb.	50c.

Antimony

Asiatic	11¼c. to 11¾c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	35c. to 38c.

Old Metals

Buyers' ideas of prices are generally lower, while sellers are not inclined to dispose of their holdings on this market. Dealers' buying prices are as follows:

	Cents per lb.
Copper, heavy and crucible	16.50
Copper, heavy and wire	15.75
Copper, light and bottoms	14.00
Brass, heavy	10.50
Brass, light	7.75
Heavy machine composition	16.00
No. 1 yellow brass turnings	10.00
No. 1 red brass or composition turnings	12.50
Lead, heavy	7.00
Lead, tea	5.00
Zinc	5.25